

THE MEDICAL JOURNAL OF AUSTRALIA

VOL. II.—34TH YEAR.

SYDNEY, SATURDAY, SEPTEMBER 20, 1947.

No. 12.

Table of Contents.

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

ORIGINAL ARTICLES—	Page.
Management of Hand Injuries, by F. H. McC. Callow	349
Management of Hand Injuries, especially the Treatment of Injuries to Bones and Joints, by Leslie J. Woodland	351
Pelvic Inflammation, by R. Francis Matters	354
Infection with Salmonella Blegdam amongst Natives of New Guinea: An Account of Fourteen Cases with Post-Mortem Reports of Four Fatal Cases, by H. Ian Jones and Frank Fenner	356
REVIEWS—	
Mental Nursing	363
Diseases of the Nose, Throat and Ear	363
Operative Surgery	363
The Glands of Destiny	363
Child Health	363
Pædiatrics for Nurses	364
A Year Book of Physical Medicine	364
Diseases of Children	364
LEADING ARTICLES—	
The Nuffield Foundation	365
CURRENT COMMENT—	
Prescription Writing	366
The Care of Premature Infants at Home	367
ABSTRACTS FROM MEDICAL LITERATURE—	
Radiology	368
Physical Therapy	368
BRITISH MEDICAL ASSOCIATION NEWS—	
Scientific	370
WORLD MEDICAL ASSOCIATION—	
Inquiry into the Present Position of the Medical Profession and its Relation to the State	372

NAVAL, MILITARY AND AIR FORCE—	Page.
Appointments	376
CORRESPONDENCE—	
Treatment of Varicose Veins by High Ligation, Section and Injection: An Investigation	377
The Future of Medical Practice	377
POST-GRADUATE WORK—	
The Post-Graduate Committee in Medicine in the University of Sydney	378
UNIVERSITY INTELLIGENCE—	
University of Melbourne	378
PUBLIC HEALTH—	
Streptomycin in Pulmonary Tuberculosis	378
OBITUARY—	
Joseph Peter Kelly	379
NOMINATIONS AND ELECTIONS	379
THE FEDERAL MEDICAL WAR RELIEF FUND	380
NOTICE—	
The Australian National Antarctic Research Expedition, 1947	380
CORRIGENDUM	380
BOOKS RECEIVED	380
DIARY FOR THE MONTH	380
MEDICAL APPOINTMENTS: IMPORTANT NOTICE	380
EDITORIAL NOTICES	380

MANAGEMENT OF HAND INJURIES.¹

By F. H. McC. CALLOW,
Sydney.

Of all injuries those affecting the hand are the most common and are likely to become even more common because of increasing mechanization of industry. The age of mechanization is the age of trauma. Although many of these injuries are not severe, the loss of man-hours in industry is tremendous, and in the more serious cases many a man loses the effective use of his hand because it is crippled by scarring and loss of joint movement as a result of injury all too often accompanied by infection of the wounds.

There are several factors which contribute to an unsatisfactory state of affairs in regard to the present position in the management of hand injuries. Firstly, this is a subject which most practitioners learn by the wasteful process of trial and error, as little attention is given to it in teaching both in the standard textbooks and in the medical schools. Another factor which contributes to permanent disability or lengthy disability is the fact that these injuries are often regarded as trivial and their treatment as being of such little importance that they may be left to the care of an inexperienced house surgeon.

Glassane, whose experience in traumatic surgery is most extensive, states that the division of surgery into minor and major procedures is astounding. "There is", he says, "no such thing as minor surgery when injuries are viewed as they should be from the point of view of their functional recovery." This commonly used classification in surgery has resulted in the most important functional unit of the locomotor system, the hand, being allocated to the realms of minor surgery; yet in the hand, judged from functional end results, are to be found problems which

challenge the technical skill of the most expert surgical craftsman. On functional standards I would prefer my own work to be judged on patients I have treated for compound fractures of the femur rather than compound fractures of the proximal phalanx of the finger. Of all surgical problems with which I am familiar, none is so difficult as the reconstruction of the badly crushed hand, yet it is common practice to relegate the care of hand injuries to junior house officers. A commoner hospital practice still is to confuse the work of a casualty department by mixing the admission of these accident problems with the life-saving medical and surgical emergencies. The result is that injuries in which recovery of function is in jeopardy take second place to the more urgent life-saving emergencies.

In the Accident Hospital in Birmingham the casualty surgeon is always one of the most senior and experienced of the resident medical officers. It has been found that by treating a lacerated hand as a surgical emergency the patient may often be returned to industry in a week or two, whereas similar conditions allowed to go along to infection often cause the loss of many weeks of labour and leave permanent disability.

We must ourselves accept a certain degree of blame because of our unwillingness to undertake treatment for many of these patients because we feel that a bad result is inevitable, and in fact many a finger has been amputated because it was denied the chance offered by surgery. In a progressive science like ours this attitude cannot be allowed to continue. The fact that we have failed in the past merely means that we must strive harder in the future.

In the army of the United States it was found necessary to establish special centres for the treatment of hand injuries where the orthopaedic surgeons specialized in this restricted field.

I hope you will pardon me for being so insistent on hand injuries being treated seriously; but I do feel that Australian surgery is lagging behind that of other parts of the world in this particular sphere, and I feel that it is

¹Read at a meeting of the New South Wales Branch of the British Medical Association on July 31, 1947.

necessary for us to realize that in this particular sphere we must do a lot of work to reach the standard of efficiency which one finds in other parts of the world.

When confronted by an injured hand we must make a careful examination and also obtain some history. I do not suggest that time be wasted in inquiring after details which can have no possible effect on the condition; but it is necessary to know the type of accident, such as whether it was a crushing injury or whether it was inflicted by a sharp cutting tool. It is most confusing to have a patient anaesthetized and presented to you and then be confronted with a deformity which could quite easily be explained if one had known the previous history of the hand.

Examination calls for time and care rather than any particular skill. Pay attention to the skin first and ascertain the amount, if any, which has been actually lost and then that likely to be lost because of the extent of its damage either by crushing or by deprivation of its blood supply. In the hand every piece of skin in which survival is likely should be retained, as the most common cause of crippling in the hand is scarring, and this results from granulating wounds.

Next we should see if all the tendons are intact. It is remarkable how small a wound may be associated with a divided tendon. Diagnosis may be difficult when there are associated fractures and other injuries, but a little care and patience will generally help decide whether the tendons are intact or not. It is always necessary to distinguish between inability to move a joint and fear of moving it because of pain.

Nerve injuries are not common in the hand itself with the exception of the digital nerves, but the median and ulnar nerves are vulnerable in the thenar and hypothenar eminences, so that sensation and motor power should always be examined. By the way, it is better to question the patient about his "feeling" rather than his "sensation" as he usually confuses the latter with "sensual".

The bones must be examined to see if there is any fracture. This may be quite obvious, but more often the actual pathognomonic signs such as crepitus and abnormal mobility are absent and we must rely on the suggestive signs of swelling, bruising and localized tenderness. X-ray examination will confirm the presence of bone injury and reveal the presence of many foreign bodies.

It is very important to examine the fingers to ascertain if there is still present a satisfactory circulation.

The primary treatment is most important and should be aimed at (i) reconstruction of the anatomical structures, (ii) prevention of sepsis and scarring, (iii) the maintenance of function. Every hand injury must be regarded as a surgical emergency.

In the first place do not "mess about" too much with the wounds other than making the necessary examination. If the skin is broken, then generally an operation is needed to repair it and a repair of a wound is a surgical procedure.

It is usually sufficient to wrap a sterile towel around the hand and take the patient to the operating room provided his general condition is satisfactory. If his general condition is not satisfactory, one must always suspect some other injury.

When the patient reaches the theatre and is anaesthetized, the first thing to do is to clean the hand; this is done in the same way that hands are always cleaned, that is, by the use of soap and water. My own practice is to have the hand held out over a dish and to have near by a large bowl full of suds which may be made of some of the medical soap preparations such as "Solyptol", but one may also use with equal efficiency "Lux" or "Rinso". The hand is washed with a soft brush or with swabs held in a suitable holder, the washing being away from the wound itself; and the used swabs being dropped into the receiving dish, into which also the waste water runs. Do not hesitate to clean out the depths of the wound, as soap and water are not harmful to the tissues, but appear to have at least some antiseptic action.

After this, clean water is poured over the hand, which is then dried and the skin painted with the surgeon's

favourite antiseptic. Drapings are then applied with the hand out on a side table or arm-board. It is better for the surgeon to sit down so that he can work comfortably and carefully.

Whether the wound is an inch long or the whole hand is involved, all the grossly damaged skin unlikely to survive is carefully clipped away until healthy tissue is reached. It is only on rare occasions that a block dissection can be made, and it seems that the advocates of block dissection work out their technique in the library rather than in the operating room.

It is necessary to excise all tissue that is certain to die, as it is in this tissue that infection develops. However, we must keep constantly in mind the fact that good skin is vital to hand function, as scar tissue is more disabling in the hand than in most other parts of the body.

At this stage it may be necessary to consider the question of amputation, and here our golden rule should be to save the maximum. It is always easy to amputate later but difficult to replace. Indications for amputation are generally, but not necessarily, the following.

1. Crushed fingers in which the finger tip is obviously without circulation.
2. Compound fractures of the proximal or middle phalanges associated with severed flexor tendons.
3. Compound fractures of two phalanges with a shattered joint between them.
4. Septic arthritis in a finger joint.
5. A finger ankylosed in extension.

The question of amputation must be considered from the point of view of ultimate function and also from the economic standpoint. A working man will need a hand that is strong and painless and not encumbered by a fragile and useless finger, whereas other people may want such a finger from the point of view of appearance. From the economic standpoint amputation may be decided on at an earlier date for a working man rather than that his family shall be let starve while we tarry unduly in our decision.

Let us pass for a moment the question of tendon repair and so on, and consider skin closure. There arises straight away the controversy about early or late skin suture. Personally I think there can be no doubt. The wound should be closed at the primary operation. There would be less infection if the damaged tissues were covered by skin after an adequate excision of devitalized tissue. As a matter of fact, most infection is introduced by or during later dressings. Colebrook has shown that most persistent wound infections are not caused by the injury but are added later.

In this connexion also we must consider the use of an immediate skin graft to cover bare areas. I think my plastic colleagues will agree that they find later repair easier, as we do, if a Thiersch graft has been applied straight away. It promotes rapid healing and prevents infection, and the proportion of "takes" is surprisingly high. In certain instances a pedicle graft can be applied immediately, for example, where a clean slice of tissue has been lost, such as occurs when a finger tip is caught in a bread slicer.

In suturing a skin wound the idea is to get close apposition of the skin edges and to prevent them from rolling in. Do not be afraid to use enough sutures. It is easy to remove them later if need be, and if a surgeon cannot decide when a stitch must be removed he should not be a surgeon. Wound seepage and infection are often due to movement between the skin edges from inefficient or insufficient suturing. Use fine needles, generally the curved cutting type, and fine non-absorbable suture material. Silk and cotton are quite satisfactory. If you want the best and are prepared to take extra time, use stainless steel, such as Babcock's wire of 34 gauge. Tantalum may also be used, but this is not so strong as steel. One aspect of suture usually overlooked is that skin is easy to bruise and otherwise traumatize by rough handling. Many surgeons use rather fearsome toothed forceps with which the skin edges are repeatedly grasped

and which often slip, so that by the time the wound is eventually closed, the edges show evidence of much mis-handling. Much of the handling of skin edges can be done with very small sharp hooks which do not slip or cause appreciable damage. Remember that infection depends on the presence of pyogenic organisms and suitable conditions for their growth, and they grow well in damaged tissues.

If it has been found that a tendon is divided, a decision must be reached as to whether it should be sutured immediately or left for secondary repair, and I would suggest that if the wound appears such that healing without infection is likely to occur, then it is best to attempt immediate suture. This is a subject requiring careful consideration in each particular case, as it is obviously waste of time repairing a tendon unless it can be covered by skin and there is a reasonable prospect of satisfactory healing, as the gliding mechanism of a tendon can be maintained only under favourable conditions.

Probably in the whole field of surgery there is no operation which results in failure with such disappointing regularity as suture of a flexor tendon on the length of the finger. The reason for this is that the tendon runs in a tunnel which has practically no elasticity and which fits the tendon snugly so that a perfectly smooth gliding mechanism must be maintained, and any irregularity of the surface either of the tendon or of its sheath means stiffening of the finger which will be permanent. Bunnell has developed what he calls an atraumatic technique to combat the two great obstacles to recovery. They are infection and fibrosis, which all too often result in the operative field's becoming a dense immovable scar functionally useless. This technique calls for extreme care in the handling of the delicate tissues of the hand, such as the avoidance of the use of forceps on a tendon or its sheath, or of repeated spongings with gauze swabs, which cause quite an appreciable amount of damage to any delicate structure, and the use of the finest needles that will carry the sutured material required, preferably those of the eyeless type.

Although many orthopaedic surgeons favour a "no-touch" technique generally, this method of operating is not so suitable for tendon suture, as gentler handling is possible with the gloved fingers. This is a subject which we cannot discuss fully at the present time.

There is still much confusion about splinting after the suture of a tendon, particularly a flexor tendon. Actually it is not absolute fixation that is needed, but rather a neutralization of the pull of the muscle; therefore it is best to splint the wrist in flexion so that muscle pull is weakened and yet a little movement is possible in the finger itself. This splinting is usually maintained for three or four weeks.

It has been stated that a successful result never follows a suture of a flexor tendon of the finger, but this statement is no longer correct, although the proportion of satisfactory results is still far too small. However, with practice and improved technique the number of successful results is increasing.

Another point for consideration is that of skin incisions, when it is necessary to enlarge a wound or make a new one. These incisions must be carefully planned, since an incision which crosses one of the flexor creases is almost certain to be followed by disability, as contraction is very common. Curved incisions such as those designed by Bunnell give the best results.

If primary repair has failed or has been inadvisable, then we must consider the time of secondary repair. The best time to operate depends on the condition of the tissues. All infection must have subsided and induration be resolved, so that the tissues have regained as much pliability as they are likely to regain.

Before repair of the deeper structures is considered, it must be decided if scarred skin should be excised first, as many an operation is doomed to failure because of the stenosing effect of massive scars. There is no time to consider the question of tendon grafts and transplants, osteotomies and orthoplasties, and other procedures which are often used for final repair of the hand.

Lastly, we must consider the rehabilitation of the injured hand, and this means restoration to normal working capacity. It should start from the moment the first treatment is given. Any joint which need not be fixed because of the injury should be used freely; and, as soon as possible, the whole hand should be put to use. Physiotherapy and occupational therapy must work hand in hand. Splints, if used, must be arranged so that they fix the appropriate part but allow other parts to move freely. Physiotherapy, such as massage and diathermy on their own, does not help very much. Such treatment can be given to a cadaver and the results are much the same.

The essential thing in recovery is active and continuous use. Restoration to full working capacity is greatly hastened if a man can be returned to work where allowance is made for his injury; in the Austin Motor Works in England a special workshop has been built and equipped where the men are able to do as much as possible, but where they are treated as ordinary workmen.

This communication has not been designed to teach the details of the management of hand injuries, but rather to arouse some discussion and interest, and if it does that my mission is accomplished.

MANAGEMENT OF HAND INJURIES, ESPECIALLY THE TREATMENT OF INJURIES TO BONES AND JOINTS.¹

By LESLIE J. WOODLAND
Sydney.

I wish to join with Dr. F. McC. Callow in pleading for adequate recognition of the serious importance of all injuries to the hand and digits. It cannot be over-emphasized that mangled fingers and hands result in more permanent deformities than major fractures of the large bones, and that injuries to the hand and fingers result in far greater economic loss to the patient in the long run. Such injuries frequently cause the patient to lose his occupation. Furthermore, such injuries are very numerous.

With regard to the frequency of hand and digit injuries, the annual report of the Workers' Compensation Commission of New South Wales⁽¹⁾ for the year 1944-1945 shows that there were 86,906 cases of compensated injury. Of these injuries, 26,862 (that is, 31%) involved either the digits or the hand, and of these, 19,168 (or 22% of all compensated injuries) involved the digits. Of injuries involving the digits (see Table I) the thumb was affected in 4705 cases (that is, 24.5%), the index finger in 5252 cases (that is, 27.4%), the middle finger in 3452 cases (that is, 18%), the ring finger in 1893 cases (that is, 9.8%), and the little finger in 2051 cases (that is, 10.7%). The remainder (9.5%) represented cases of multiple digit injuries.

An analysis⁽²⁾ of types of injuries of digits (see Table II) shows that of thumb injuries, 5% were fractures, 0.7% dislocations and 5% sprains—that is, the total number of fractures, dislocations and sprains was 518. Of index finger injuries, 6.4% were fractures, 0.2% dislocations and 1% sprains—that is, the total number of fractures, dislocations and sprains was 405. Of middle finger injuries, 8% were fractures, 0.3% dislocations and 1.1% sprains—that is, the total number of fractures, dislocations and sprains was 330. Of injuries affecting the ring finger, there were 175 fractures, dislocations and sprains, and of injuries affecting the little finger there were 280. From these figures, one concludes that fracture occurs most frequently in the index finger, and that sprain of the thumb is more common than sprains of all other digits combined. The ring finger is the least affected digit.

From the reports of the Workers' Compensation Commission it was found that the average period of incapacity

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on July 31, 1947.

for all accidents was 3·7 weeks; but I was unable to ascertain the average period of disability or the permanent disability rate following injuries to hands or digits. Of persons with compensated injury, 2·5% appear before medical boards. An analysis of the medical boards held in the year 1939-1940 in New South Wales showed that of 2262 medical boards, in 772 cases there were injured digits (that is, 31·9%) and in 137 cases there were injured hands (that is, 909 hand and digit injuries). Therefore, of all medical boards held in New South Wales, 38% were held for cases of injury to a hand or digits. Whilst a

TABLE I.

Location and Nature of Injury, Accident Males Only.
(The Workers' Compensation Commission Report of New South Wales,
Volume XIX, Part IV, 1945, page 258 (Table VII).)

	1944-45	1943	1942	1941	1940
Hand	7,694	7,636	6,051	7,065	6,642
Thumb	4,705	4,569	3,605	3,907	3,742
Index finger .. .	5,252	5,102	3,723	4,298	4,080
Middle finger .. .	3,452	3,436	2,968	2,812	2,674
Ring finger .. .	1,873	1,922	1,506	1,609	1,595
Little finger .. .	2,051	1,850	1,821	1,702	1,667
Two fingers .. .	1,210	1,183	979	1,107	1,011
Three fingers .. .	196	198	171	193	187
Four fingers .. .	413	254	302	214	263
Loss of thumb .. .	21	25	30	15	25
Loss of index finger .. .	63	52	110	48	65
Loss of joint of thumb .. .	52	50	65	29	28
Loss of the little, middle or ring fingers .. .	131	148	134	132	117
Loss of toe or joint of finger	401	476	277	478	380
Total compensated injury	86,960	83,532	61,402	67,318	61,209

small percentage of these patients may have had no permanent disability, it is reasonable to assume that the great majority of patients had some permanent disability. This does not mean that there were only, say, 900 industrial workers permanently injured in the hand or in one or more digits in the year 1939-1940. Many such patients do not appear before a medical board. It is, of course, impossible to ascertain the number of hand disabilities occurring in patients not covered by the *Workers' Compensation Act*.

United States⁽¹⁾ figures for the year 1938 taken from six States show that of all industrial injuries, 22% were

TABLE II.

Location and Nature of the Injury, Accident Males Only.
(The Workers' Compensation Commission Report of New South Wales,
Volume XIX, Part IV, 1945, page 257.)

	Cuts, Bruises et cetera.	Burns.	Foreign Bodies.	Dislocations.	Fractures.	Sprains.
Hand	6,223	709	187	2	263	267
Arm and hand .. .	42	24	—	—	1	5
Hand and face .. .	21	47	—	—	1	—
Hand and foot .. .	6	6	—	—	3	1
Thumb	3,956	75	144	33	253	232
Both thumbs .. .	2	—	—	—	—	—
Index finger .. .	4,590	79	158	10	339	56
Both index fingers .. .	6	—	—	—	—	—
Middle finger .. .	2,957	46	108	11	279	40
Ring finger .. .	1,622	26	40	11	144	20
Little finger .. .	1,680	32	43	9	249	32
Two fingers .. .	1,054	65	3	—	74	11
Three fingers .. .	153	28	—	—	14	1
Four fingers .. .	313	65	—	2	25	6

injuries to the fingers, and these people received 14% of the total compensation paid. Hand injuries accounted for 8% of cases, and these people received 5% of the total compensation. In an analysis of the amount of total compensation paid for injuries to digits, it is important to recognize that in many cases—in fact, in the majority—only superficial wounds are sustained which heal in a few days, and the patient is not away from work for more than ten days.

Toland and Kornbluh,⁽²⁾ in a survey of 3000 industrial accidents, found 9·2% of injuries to hands and 33·8% of injuries to the fingers.

Kossoris⁽³⁾ is quoted as stating that injuries to fingers or hands cause 77% of all permanent disabling injuries.

Bunnell⁽⁴⁾ states that of all industrial accidents, injuries to the wrist, hands and digits amount to over one-third of the number and about one-fifth of the cost. Figures given by the United States of America National Safety Council for the years 1932-1942 show injuries to hands and digits to represent 33% of cases and 18% of total expenses. The incidence, of course, varies with the nature of the industry. In some industries hand and digit injuries have been reported to be as high as 62% of total injuries and compensation as high as 46% of the total. The publication, "Accident Facts", deduced from the statistics of seven States of the United States of America in 1942, states that of approximately 50,000 permanent disabilities, 45% were of hands and digits. Of all injuries, 21% resulted in some permanent disability; 9% of all injuries led to some permanent disability of hands and fingers. From these American figures we deduce that 27% of hand injuries in industry cause some permanent disability. Roughly, one in four of all hand and digit injuries becomes infected—a frequency four times that found in injuries of other parts. The average compensation expense of a hand injury is doubled if the wound becomes infected.

New South Wales figures for the incidence of hand and digit injuries in industry are almost identical with the available American figures.

Solving the problem of hand injuries is like working out a crossword puzzle. If one question is not correctly answered, the puzzle is unsolved. In injuries of the hand and particularly of digits, if one tissue—be it skin, tendon, ligament, bone or joint—is not restored to its pre-accident condition, the result is partial or complete failure to prevent permanent disability.

I shall discuss mainly injuries to bone and joints of digits. Finger fractures are so frequent and result in so much disability that they cost about as much in compensation as do fractures of the long bones.

In which respects do fractures and joint injuries of the hand differ from fractures and joint injuries elsewhere? The principles of treating fractures in general apply to those in the hand; but in addition there are some special aspects. The bones of the hand receive such an excellent blood supply that satisfactory union usually occurs in three weeks. Non-union is rare, and when it does occur it is due to wide separation of the fragments or to excessive movements or to over-traction. Decalcification may become extreme throughout the hand owing to hyperaemia, a reflex from pain, if the fracture is not immobilized. If sepsis occurs, hyperaemia with resultant decalcification is pronounced. The mechanism of bone, joints and tendons in the hand is so exact and nicely placed that deformity from dislocation or malunion destroys both the tendon leverage of the joints and the muscle balance throughout the hand. Following fractures, tendons may adhere in callus in the hand or digits.

Bunnell⁽⁵⁾ considers that post-traumatic stiffness in the hand is the big problem in treatment of fractures and dislocation of the hand, because the mechanical parts are so intimately and compactly fitted together that any shortening of the ligaments limits motion, and because the long flexors and the long extensors are practically each a common muscle to all of the digits; especially does this apply to the *flexor profundus* and the *extensor communis digitorum*. One tendon held prevents the muscle from pulling on the adjoining tendons.

Why do finger joints stiffen so readily on slight provocation? A normal finger splinted in full flexion or extension will stiffen. This tendency to stiffness varies with age and with the individual. When the nerve supply is cut off, degenerative trophic changes occur in all the tissues from the skin to the joint inclusive. Irritative nerve lesions cause a more pronounced change than when a nerve is completely divided. Diffuse swelling, osteoporosis, atrophy and stiffening of the joints are present. When a hand is swollen from whatever cause, fibrin is deposited between

industrial
d 33-8% of
to fingers
injuries.
ts, injuries
r one-third
Figures
nal Safety
hands and
l expenses
ure of the
injuries have
total. The
e statistics
ca in 1942,
disabilities,
% resulted
ies led to
rs. From
of hand
disability,
es becomes
n injuries
ense of a
infected.
hand and
with the

e working
correctly
the hand
in, tendon,
re-accident
failure to

joints of
sult in so
compensa-

ies of the
elsewhere?
apply to
me special
excellent
occurs in
oes occur
ats or to
lication
owing to
is not
resultant
of bone,
nd nicely
n destroys
e muscle
s, tendons

ss in the
ures and
parts are
that any
a because
practically
especially
extensor
the muscle

t provoca-
extension
age and
s cut off,
ues from
e lesions
nerve is
, atrophy
hand is
between

the various tissue layers and in the folds of the joint capsules, between tendons and their sheaths, throughout the ligaments and between and within the muscles. While soaked in exudate, all these tissues swell with oedema and become shorter and thicker. The fibrin seals them in this condition, and soon fibroblasts, which later develop into fibrous tissue, permanently fix these structures in a shorter and thicker condition. Swelling from oedema follows trauma to bones, joints and ligaments, interference with circulation, and especially infection. Disuse of the hand may alone cause oedema, as the tissue fluids stagnate from the lack of the pumping action of muscle contraction and the movements of joints.

How can we improve our results? (i) X-ray examination should be employed to avoid errors in diagnosis, especially in the case of children. (ii) An accurate reduction of fractures and dislocations should be secured and injured parts only maintained at rest in a position of function until healing has occurred. (iii) In compound fractures infection can usually be avoided and quick healing secured by early and careful operating theatre technique as pointed out by Dr. Callow, combined with the prophylactic use of penicillin and the sulphonamide drugs. (iv) Oedema should be diminished by elevation of the limb and physiological splinting. One must be a rabid fanatic in the crusade against oedema in order to secure good results. (v) Occupational therapy of a remedial type (for example, selected work) should be begun as soon as possible after the splint has been removed. If the patient is sent to a physical therapist, both the patient and the physical therapist must be told that passive movements must on no account be used.

Hambly⁽⁶⁾ considers that, because of the bad results of our present system of treatment and control, all injuries of the hand and fingers should be treated in a special service.

It is obviously impossible in the time available to attempt to discuss the treatment of fractures and dislocations of the hand and digits in any comprehensive manner. The subject is adequately treated in excellent textbooks by Watson-Jones and Bunnell. To each of these authors I am indebted for material in the preparation of this paper.

Let us discuss the two commonest injuries of bones and joints of digits deduced from reports of the Workers' Compensation Commission of New South Wales. These are fracture of the index finger and sprains of the thumb.

Fracture of the Index Finger.

The proximal phalanx of the index finger is most frequently involved, and from this fracture the worst results are obtained. I shall discuss this fracture in detail. The usual deformity is palmar angulation because of the dorsal aponeurosis, which is held taut by the intrinsic muscles and the long extensor. The angulation is increased by the tone of the long flexor muscles. Under general or local anaesthesia the fracture is reduced by traction and manipulation. The distal fragment should be placed in line with the proximal fragment.

Fractures of phalanges must be reduced and the parts immobilized with special care. Any angular deformity limits movement. In fractures of at least the proximal two phalanges, a good functional result will never occur unless one obtains a good anatomical result. It is wishful thinking to hope that early use by the patient will compensate for incomplete reduction. The injured finger must be immobilized. Stiffness of joints will not be avoided by refusal to immobilize a fracture, a dislocation or a severe sprain.

The injured finger must be immobilized in semi-flexion for many reasons, of which the following are examples. (i) This is the position of rest, and in this position muscle tension is relaxed. (ii) If one finger is held extended, because of the interdigitations of the extensor tendons, full flexion of the other fingers is impossible and so they cannot be exercised through a normal range. (iii) The lateral ligaments of the metacarpo-phalangeal joints are taut when a finger is flexed at the metacarpo-phalangeal joint. If a joint is splinted with ligaments lax and bathed in oedema, the fibres are literally glued

together, the ligaments are shortened and movement is effectively blocked. (iv) The metacarpal head is wider anteriorly than posteriorly. (v) Only by flexion can the distal fragment be brought in line with the proximal fragment.

If there has been no displacement, and in some cases of transverse fracture when the displacement has been fully corrected, the digit is bound to a T-shaped aluminium splint with adhesive plaster. When a fracture of the proximal phalanx is being treated, the metacarpo-phalangeal joint is splinted at an angle of 45°, the proximal interphalangeal joint at 90° and the distal joint at 45°. In flexion all fingers should converge towards the tubercle of the navicular bone. If, when the index finger has been splinted as above, the tip does not point towards the tubercle of the navicular, then either adduction or abduction deformity is present at the site of fracture which must be corrected. The finger nail is used as a guide to check any rotation deformity. When the fracture is oblique or unstable, continuous traction is necessary. The finger is immobilized by means of a finger splint of malleable wire applied to the flexor surface of the finger and incorporated in a forearm non-padded plaster cast.

The most effective means of obtaining continuous traction is by a stirrup or wire through the pulp. The end of the stirrup is directly attached to the end of the finger splint by means of a hook, the handle of which is threaded. The handle is passed through a loop at the end of the splint. A butterfly nut is threaded over the end of the handle of the hook and can be tightened as required in order to maintain a uniform pull.

In the arrangement of splinting, care must be taken to avoid interference with the movement of other fingers. These digits must be actively exercised and the surgeon must see that each joint is exercised with power through the maximum range many times per day. The patient is clearly shown the four movements, which must be practised from the commencement of treatment. The danger of redisplacement of phalangeal fractures is very real. Recurrence of the original displacement is often observed, usually owing to the splint or tractions becoming "loose".

Fixation is usually necessary for three weeks and rarely for four weeks. I disagree with the recent tendency to lessen the period of immobilization to one week, as redisplacements will occur in many cases. Furthermore, pain in the fractured digit will not only prevent movement of the digit, but will inhibit movements in the unaffected digits. When traction is employed, daily supervision is necessary to see that traction is effective and not just "on for appearances". When the splint is removed the patient is encouraged to use the finger, for example, exercising in hot soap suds, squeezing of a rubber ball, gripping a piece of board in the palm (the board is so shaped that all three finger joints may be exercised). At the earliest opportunity light work, if possible of a remedial nature, should be found for the patient in his own factory. Occupational therapy of this type is far better than physical therapy or occupational therapy at a clinic.

Sprains of the Thumb.

Sprain of the metacarpo-phalangeal joint of the thumb is a frequent injury. Either the lateral or the volar ligaments may be affected. The joint should be splinted by firm strapping or collodion ribbon gauze for two to three weeks.

Even when sprained digit joints are splinted early, recovery is sometimes slow, and it may be several months before joint thickening finally subsides and full movements are possible.

If a sprained digit joint has not been adequately splinted in the early stages, a condition of subacute arthritis or peri-arthritis often develops. The patient is then away from work for many months with a painful thickened joint, and frequently a permanent disability occurs.

Fortunately, in many cases, patients with arthritis, peri-arthritis or chronic subluxations of any of the three joints of the thumb who do not respond to conservative treatment may be benefited by operation. If movements

at the unaffected joint occur through a good range, the affected joints may be arthrodesed without material permanent disability.

If the external ligaments of the metacarpo-phalangeal joint of the thumb are completely torn or evulsed, the phalanx can be subluxated laterally, and this instability persists unless the joint is completely immobilized for four to six weeks. Watson-Jones⁽¹²⁾ states that lateral instability of the thumb due to rupture of the metacarpo-phalangeal ligament on the side adjacent to the index finger is particularly incapacitating, because the pincer-like grip between the thumb and the index finger is seriously impaired. Whenever a fragment from the base of the phalanx is rotated, retracted or displaced into the joint, it should be replaced by open operation. The thumb should be splinted in opposition and abduction. Complete fixation is necessary for four to six weeks.

Subluxation of the base of the thumb metacarpal may result from frequently repeated traumata or from debility. The base of the thumb metacarpal is unduly prominent and tender, and the joint is often the site of osteoarthritis. The subluxation is easily reduced and a plaster cast should be applied for one month. Occasionally subluxation results from one single trauma. This, however, is rare without an associated Bennett's fracture.

Sepsis of the Hand.

Bunnell⁽¹⁰⁾ states that hand infections cause from 5% to 9% of grave disabilities in industry. I do not propose to discuss the differential diagnosis of infection in the hand, which may occur in pads of the digits or in superficial palmar spaces, in tendon sheaths, in deep palmar spaces and in bone or joints or on the dorsum of the hand. The principles of treatment are complete rest, including the application of a plaster cast, elevation of the limb to diminish oedema, antibacterial therapy and, above all, early hunting for pus under a general anaesthetic with a tourniquet on the infected limb. A position of function must be maintained whilst healing is occurring, otherwise muscle imbalance may occur.

Treatment of Stiff Fingers.

The treatment of stiff fingers is a difficult task; rather let us try to prevent stiffness by measures previously outlined.

If stiffness is due to immobility and oedema and muscle imbalance has not yet occurred, the essential treatment is constant active exercise. Finger exercises must be practised for five minutes every hour. Occupational therapy is of great value, and an early return to suitable work is ideal therapy. If scar tissue is preventing mobilization of the fingers, then the scar must be excised and skin grafted. If there is muscle imbalance with clawing of digits, exercise alone will be insufficient. In these circumstances the hand and digits must be placed in a position of function, if necessary by manipulation under general anaesthesia, followed by plaster fixation combined with elastic traction loops. The only indication for manipulation of joints of digits is when hyperextension deformity occurs at the metacarpo-phalangeal joint, with flexion deformity of the inter-phalangeal joints due to muscle imbalance. The metacarpo-phalangeal joint is flexed with a gliding movement, associated with a strong pull on the digit. Merely bending the finger at the metacarpo-phalangeal joint may do much damage by tearing the collateral and volar ligaments. A plaster cast is applied with the wrist dorsiflexed and the affected digit or digits flexed to 45° at the metacarpo-phalangeal joint. With the metacarpo-phalangeal joint fixed in a plaster cast in semi-flexion and continuous traction by elastic bands correcting the flexion deformity at the inter-phalangeal joints, the intrinsic muscles are relaxed, the long tendons are stretched, and so muscle balance is restored. Sometimes continuous mild correction, either by firm splinting or by elastic traction, will mobilize stiffened joints without a preliminary manipulation.

If traction is used to correct deformity, it must not be continued for too long a period, otherwise the joints will stiffen.

Recently capsulotomy and excision⁽¹¹⁾ of the collateral ligaments of the metacarpo-phalangeal joints have been advocated for stiffness of the metacarpo-phalangeal joints and the results are encouraging.

Associated muscle imbalance may be corrected by transplantation of the *flexor digitorum sublimis* to the lateral slip of the extensor to aid the weakened intrinsic muscles.

Watson-Jones⁽¹²⁾ states that stiffness due to fracture of the phalanges with resultant adhesions of the flexor tendons, infected wound of the finger or ankylosis of the joints can seldom be improved by exercise, manipulation, traction or open operation. I would say that the above statement is, on the whole, true, except that arthroplasty of the metacarpo-phalangeal joint of a finger is well worth while if the tendons and other joints are unaffected. I have had no success with arthroplasty of the much more unstable interphalangeal joints. It is also worth while, if the joints are mobile, to free an adherent tendon. When an adherent tendon is freed, it is usually necessary after excision of the scar tissue to use a free paratenon graft to prevent adhesions from reforming.

Conclusion.

The function of this paper has been mainly to draw attention to the poor results at present obtained in the treatment of hand injuries. In addition to the uniform adoption of the improved technique in the treatment of fracture of bone and joints of the hands, more hospital beds and facilities for remedial occupational therapy in workshops are necessary before the disability rate will be lowered.

References.

- ⁽¹⁾ New South Wales Workers' Compensation Reports, Volume XIX, Part IV, 1945, page 258.
- ⁽²⁾ New South Wales Workers' Compensation Reports, Volume XIX, Part IV, 1945, page 257.
- ⁽³⁾ "Accident Facts, 1940 Addition", National Safety Council Incorporated, Chicago, page 23.
- ⁽⁴⁾ J. J. Toland and I. H. Kornbluh; "Industrial Injuries to Fingers", *Pennsylvania Medical Journal*, Volume XLVII, February, 1944, page 466.
- ⁽⁵⁾ Kossoris; Cited in "The 1944 Year Book of Industrial and Orthopedic Surgery", page 407.
- ⁽⁶⁾ S. Bunnell; "Surgery of the Hand", Second Impression, 1944, page 596.
- ⁽⁷⁾ S. Bunnell; *Loco citato*, page 503.
- ⁽⁸⁾ E. Hambly; "Surgery of the Hand and Fingers—Injuries and Infection", *The Medical Press*, April 9, 1947, page 283.
- ⁽⁹⁾ R. Watson-Jones; "Fractures and Joint Injuries", Second Edition, Volume II, page 587.
- ⁽¹⁰⁾ S. Bunnell; *Loco citato*, page 598.
- ⁽¹¹⁾ S. B. Fowler; "Mobilization of Metacarpo-Phalangeal Joints; Arthroplasty and Capsulotomy", *The Journal of Bone and Joint Surgery*, April, 1947, page 196.
- ⁽¹²⁾ R. Watson-Jones; "Fractures and Joint Injuries", page 600.

PELVIC INFLAMMATION.¹

By R. FRANCIS MATTERS,
Adelaide.

THE term "pelvic inflammation" includes both acute and chronic cases of inflammation of the cellular and connective tissue (inflammation of which is known as parametritis) and of the pelvic part of the peritoneum and adnexa (which is known as pelvic peritonitis). There is an inflammatory condition of the uterus known as metritis, and this is usually associated with one or the other of the foregoing. Although cervicitis and vaginitis do not come under the heading of pelvic inflammation in the strict sense of the term, yet it is proposed to include these conditions in this paper.

Anatomy.

Initially your attention is drawn to pelvic anatomical features, which are of much importance in pelvic inflam-

¹ Read at a meeting of the South Australian Branch of the British Medical Association on May 31, 1947, at Riverton.

mation, especially the pelvic cellular tissue. (i) There is the loose tissue at the base of the broad ligament which is associated with the transverse cervical ligament. (ii) The cellular tissue of the parametrium extends forwards and laterally in the extraperitoneal tissue of the round ligament. (iii) The cellular tissue spreads forwards in the utero-vesical area and it then extends around the bladder to the cave of Retzius behind the symphysis pubis. (iv) An extension from the parametrium laterally is a broad mass of fibro-cellular tissue spreading over the iliacus muscle and pelvic brim. (v) The cellular tissue also passes backwards along the infundibulo-pelvic fold to the psoas and renal areas. (vi) It also extends posteriorly along the utero-sacral ligaments.

Blood Vessels of the Pelvis.

From the aspect of the pelvic inflammation, the blood vessels, especially the veins, are important.

The arterial supply is through (a) the ovarian artery, which arises from the aorta, and (b) the anterior division of the internal iliac artery. The latter gives branches which include the uterine artery, the superior, middle and inferior vesical arteries, and also the middle hæmorrhoidal artery.

The venous plexuses include (a) the ovarian veins, which originate in the pampiniform plexus of the mesosalpinx and pass along the infundibulo-pelvic fold, (b) the uterine plexus running under the peritoneum along the lateral border of the uterus and into the broad ligament, (c) the vesical plexus surrounding the base of the bladder and extending to the cave of Retzius, (d) the vaginal plexus, which surrounds the vagina and communicates with the vesical and hæmorrhoidal plexuses.

Lymphatics of the Pelvis.

In pelvic inflammation the pelvic lymphatics and their distribution are as follows. (a) The upper part of the vagina and the cervix drain to a parametrial node in the base of the broad ligament, where the uterine artery crosses the ureter; thence the drainage is to the obturator and iliac glands and finally to the lumbar glands. (b) The fundus drains through (i) the round ligaments to the inguinal glands, (ii) the utero-sacral ligaments to the sacral glands, (iii) the infundibulo-pelvic ligaments to the lumbar glands. Eventually these all drain into the aortic glands.

Ætiology.

Pelvic inflammation is most commonly caused by bacteria which enter through lacerations of the cervix (as in abortion and parturition), or by gonorrhœa and syphilis, or by extension from the bowel (for example, *Bacillus coli communis*), or they are blood-borne (as in pneumococcal peritonitis and tuberculous peritonitis).

The other infections more confined to the vagina and cervix are infections with *Trichomonas vaginalis*, *Monilia albicans*, diphtheria organisms, streptothrix and others.

Acute Inflammation.

Acute pelvic inflammation may be parametrial (pelvic cellulitis) or perimetrial (pelvic peritonitis). The infection may be due to (i) the streptococcus, (ii) the staphylococcus, (iii) *Bacillus coli communis*, (iv) the gonococcus, (v) *Bacillus welchii*. It may be introduced by abortion or childbirth; the infection may spread through the cervical canal and uterine cavity to the Fallopian tube, or it may spread through the uterine tissues, or the extension may be either directly through the cervical tissues or via lymphatics or blood vessels. The infection may be introduced by extension from inflamed areas—for example, Fallopian tubes, appendix or pelvic cellular tissue. The infection may also be associated with a neoplasm or endometrioma.

The induction of abortion under poor surgical conditions is a very potent cause of acute pelvic inflammation, and so is careless delivery at term. The cervix is usually torn, so that bacterial invasion by streptococci, staphylococci or other organisms may occur with great rapidity. The infection either spreads to the parametrium to pro-

duce acute cellulitis or it extends to the perimetrium and produces acute pelvic peritonitis. The latter spread may occur directly through the uterine cavity or via the lymphatics.

In acute pelvic inflammation the abdomen is usually rather rigid. The patient draws up the legs and flexes the thighs on the abdomen. The vagina is hot and the uterus feels soft, irregular and boggy. The patient complains of pain in the lower part of the pelvis; she also suffers from dysuria and diarrhœa and from attacks of chilliness.

The modern treatment of the acute stage, whether it is due to pyogenic organisms, *Bacillus welchii* or gonococci, is to give penicillin, 30,000 units at intervals of three hours, and to combine this with oral administration of sulphadiazine or sulphamerazine. Rest and careful nursing are imperative, and blood transfusions are indicated in many cases, especially when the general health is poor. If an abscess forms colpotomy is undertaken.

Chronic Inflammation.

It is proposed to mention under the heading of chronic inflammation two infections of the vagina which are not strictly types of pelvic inflammation. These infections are those due to (a) *Trichomonas vaginalis* and (b) *Monilia albicans* or *Oidium*.

Trichomonas vaginalis is found in vaginal infections in pools of greenish, frothy discharge, which has a curious pungent odour of considerable clinical significance. When a few drops of the discharge with warm saline solution are placed on a slide and examined under a microscope, motile flagellate organisms will be observed.

When *Trichomonas vaginalis* is present the vaginal wall is reddened, and lilac-coloured punctate areas appear on the cervix and vagina. *Monilia albicans* or *Oidium* is found in the vagina, as one of the yeast forms, and the effect upon the vagina is the production of redness of the epithelium, and typical white thrush-like patches are distributed over the vaginal surface. The discharge is profuse, flocculent, yellow-white and very irritating. It is sometimes found during pregnancy, when it causes great discomfort to the patient, and the pruritus even causes severe insomnia.

Monilial invasion responds readily when treated by a 1% aqueous solution of gentian violet. Weekes, of Sydney, has published very successful results with iodine. *Trichomonas vaginalis* vaginitis is treated by cleaning out the vagina with "Kaomagma" and insufflating it with silver picrate powder, the patient being in the knee-chest position. Follow-up treatment with silver picrate suppositories, "Tricharsen", "Stovarsol" and the like may be necessary.

Chronic Parametritis and Perimetritis.

Chronic parametritis and perimetritis occur either by way of cervical laceration or through the cervical canal, or they are due to the recrudescence of latent gonorrhœa brought about by cervical trauma or excessive sexual stimulation. Fehling referred to the cervix as the pelvic tonsil, because of many muscle and joint pains associated with cervical infection. Other infections arise by extension from traumatized or devitalized bowel wall, the common infecting agent in these cases being *Bacillus coli communis*.

The pelvic part of the peritoneum may be infected by tubercle bacilli, with the long-standing chronic results of adhesions *et cetera*, or it may be infected by *Streptothrix actinomyces*. Irritating fluids are sometimes forced through the Fallopian tubes into the pelvis when the uterus is irrigated under pressure; this is done usually in order to produce criminal abortion. In these cases the condition may settle down; but the peritoneum is so irritated that in many instances adhesions occur, resulting in chronic pelvic peritonitis.

The following organisms are the most frequent causes of pelvic peritonitis: *Staphylococcus pyogenes*, the streptococcus, *Bacillus coli communis*, the gonococcus, *Mycobacterium tuberculosis*, *Spirochæta pallida*, *Diplococcus pneumoniae*, *Streptothrix actinomyces*, the Klebs-Löffler bacillus, and *Bacillus pyocyaneus*.

The patient complains of backache, of premenstrual dysmenorrhœa (which is relieved by the onset of menstruation), of menorrhagia, of dyschezia or of constipation. Dyspareunia is a symptom alone or combined with any of the foregoing. Any or all of the symptoms mentioned may be present.

The lower part of the abdomen is tender, and movement of the thighs on the abdomen is restricted. Vaginal examination reveals a large uterus which is retroverted. The mobility of the cervix (in cases of parametritis) is much reduced, the lateral fornices are shallower than normal, and there is a band of rigid tissue extending from the cervix in the ligaments of Makenrodt (transverse cervical or cardinal ligaments).

In pelvic peritonitis the fornices feel "full", and the ovary and Fallopian tube are usually drawn towards the uterine cornu. In other cases, particularly where pus has formed, the heavy tubo-ovarian mass sags and becomes adherent to the postero-lateral surface of the uterus by adhesions which are so dense as to give the impression, on vaginal examination, that the masses are a part of the uterus, and in many cases it has been found that they have been mistaken for fibroid tumours, especially when these occur in association with menorrhagia. The walls of the tubes and adhesions are so thickened and so dense as to mask the fluctuation of the contained pus, which has long since become sterile.

Parametritis is reduced by removal of the cause or focus of infection in the cervix. Much relief is brought about by cauterization of the cervix, the cautery tracing radiating striæ like the spokes of a wheel; but better still is amputation of the cervix by coning of the endocervix according to Sturmdorf's method. This treatment does not eliminate the fibrosis of the parametrium, but it removes the constant focus of infection and allows the parametrium to gain more normal resilience.

Frequent hot sitz-baths and the application of diathermy through the fornices are very restful measures. In Vienna the patients had a bag of hot mercury (like a Champetier de Ribes bag) placed in the fornix for an hour each day as a means of improving local circulation. Hyperæmia can be produced also by doses of œstrin. This hormone has an almost specific effect upon the pelvic organs and cellular tissue in regard to hyperæmia.

Treatment.

The treatment of chronic pelvic peritonitis is divisible into two methods, medical and surgical. Medical treatment is given by means of diathermy, short-wave therapy, sitz-baths, endocrine therapy and general physical therapy. These may reduce the severity of the symptoms, but usually take a long time. Most patients seek surgical intervention sooner or later, as they are wrongly under the impression that there are two alternative treatments and that the condition can be treated medically over a long time or surgically for a quick cure.

Diathermy treatment is produced by the active electrode in the vaginal fornix which is on the side of the inflammation, and the inactive electrode, which is a belt of limpet metal, around the waist of the patient. Short-wave therapy is given through and through, one plate being placed anteriorly and the other plate posteriorly. The main line of endocrine treatment is by means of œstrin, which appreciably increases the pelvic circulation. In some cases of pelvic peritonitis, however, an excess of this hormone is already present on account of the inflammatory processes involving the ovary.

Surgical treatment may be conservative or radical. Conservative treatment usually means removal of the grossly involved adnexa. The adhesions are separated and the Fallopian tube and the ovary or part of the ovary are extirpated. If dense adhesions are present and if raw surfaces result from the removal of the diseased organs—as, for example, the raw surface after dissection of the inflamed adnexa from the broad ligament—then "Amfertin" is introduced into the pelvis before the abdomen is closed. "Amfertin" is an extract of *liquor amnii*. Its use was originally based on the fact that in a few recorded cases

of rupture of the amniotic sac some days before delivery of the fœtus small adhesions of the axillæ and popliteal areas were found, but that in no case in which a fœtus was normally born soon after rupture of the membranes were these found. Subsequent animal experiments supported this theory. At operation for Cesarean section *liquor amnii* has been left in the peritoneal cavity deliberately, and subsequent abdominal sections have shown the improved state of the abdominal cavity compared with those cases in which this form of treatment was not given.

Radical surgical treatment is now regarded as the proper procedure in most cases, because it is considered that the remaining pelvic organs, after extirpation, frequently are the source of cryptogenic absorption. Panhysterectomy is therefore chosen by many gynecologists as the best final treatment in these cases. This treatment is severely radical in young women and it is not proposed that it is necessarily the best procedure. It is considered that every case should be treated on its merits and as far as possible conservative measures are enjoined, particularly with regard to the ovaries in young women. It is believed that, because the ovaries appear to govern the subject's personality, conservation of one or both of these organs is of considerable importance, especially in the case of younger women.

Conclusion.

In conclusion it is hoped that cases of pelvic inflammation will be investigated thoroughly and with considered judgement, that the type of treatment will be carefully chosen, that the age and domestic factors as well as pathological states will be considered before radical surgical treatment is undertaken, so that by sound judgement, careful observation and surgical skill the greatest good may be done for the patient.

INFECTION WITH SALMONELLA BLEGDAM AMONGST NATIVES OF NEW GUINEA: AN ACCOUNT OF FOURTEEN CASES WITH POST-MORTEM REPORTS OF FOUR FATAL CASES.

By H. IAN JONES,¹

Melbourne,

AND

FRANK FENNER,²

Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne.

SALMONELLA BLEGDAM, first isolated in Copenhagen from the blood of a patient with pneumonia and described by Kauffmann,⁽¹⁾ has now been shown to cause enteric fever in man in New Guinea and adjacent islands⁽²⁾⁽³⁾⁽⁴⁾⁽⁵⁾ and in the Philippines.⁽⁶⁾ This paper reports in some detail the clinical and pathological features of several fatal *Salmonella blegdam* infections seen in New Guinea natives by one of us (H.I.J.) and briefly records the histories of other known infections in natives of New Guinea and the Solomon Islands. Reference is also made to two cases in Australian service personnel who were probably infected in Morotai and in Australia respectively.

Clinical Records.

Brief histories and complete laboratory findings of the cases in this series are set out in Table I. The first six cases have been mentioned previously in either Fenner and Jackson's⁽²⁾ or Atkinson's⁽³⁾ papers, and the same case numbers have been used for them here as in those papers. Detailed clinical histories of five severely infected subjects and post-mortem reports on four of them follow.

CASE N VII.—The patient was a well-nourished youth from Mount Hagen, aged about seventeen years. He was

¹ Formerly a medical officer with A.N.G.A.U.

² Francis Haley Research Fellow, Department of Experimental Medicine, University of Melbourne.

admitted to the Native Hospital, Lae, with a history of fever, headache, cough and pain in the chest, of twenty-four hours' duration. His temperature was high and his pulse rate and respiration rate were increased. The only abnormal finding on physical examination was an area in the lower lobe of the right lung over which the percussion note was impaired, diminished vesicular murmur was present, and fine râles were audible.

He was regarded as suffering from right basal pneumonia and treated with sulphamerazine. He became drowsy, and *Plasmodium malariae* trophozoites were found in a blood film. "Atebrin" (0.6 gramme per day) was given orally. On the third day he was comatose, his pupils were unequal and a transient external strabismus was present. The cerebro-spinal fluid was under slightly increased pressure, but contained no abnormal constituents. Although *Plasmodium falciparum* had not been found in blood films, cerebral malaria was considered to be a possible cause of his symptoms, and intravenous injections of quinine hydrochloride were given, with no effect. Blood taken for culture on the third day yielded *Salmonella blegdam*. Penicillin therapy was commenced, 15,000 units being given every three hours.

On the fourth day he was slightly jaundiced and the hæmoglobin content of the blood was two grammes per centum lower than on the second day. The spleen became palpable at this stage. The liver was not palpable. The chest signs disappeared, but the temperature remained elevated for another ten days before falling by lysis. Lumbar puncture on the sixth day yielded normal cerebro-spinal fluid.

With subsidence of the fever the mental condition of the patient improved until he was able to obey simple instructions, when it became apparent that a motor aphasia had developed. This persisted for many weeks, gradually diminishing until about two months after the cessation of the fever he appeared quite normal.

CASE N VIII.—The patient, a native of Mount Hagen, was a well-built youth, aged about eighteen years. He was admitted to the Native Hospital, Lae, on August 18, 1945, suffering from severe bacillary dysentery. *Shigella shiga* was isolated from the stool and sulphaguanidine therapy was begun. There was no response to this treatment, the temperature ranging from 99° to 102° F. and the stools consisting largely of blood and mucus. Five days after his admission to hospital sulphapyridine was substituted for sulphaguanidine, with rapid improvement, until nine days after his admission to hospital the temperature and stools were normal.

However, four days later his temperature rose again, and he became miserable, drowsy and slightly jaundiced. (In Table I, and in the ensuing text, this day is taken as the first day of the illness due to *Salmonella blegdam*.) Next day he was much worse, having a temperature of 106° F.; he was drowsy, and had rapidly increasing pallor and jaundice. A hæmic murmur developed at the apex of the heart, and an area of dullness and diminished air entry was detected at the base of the right lung. Repeated examinations of blood films failed to reveal malaria parasites, but the "Atebrin" dosage was increased from 0.1 gramme per day, the suppressive dose which had been given since his admission to hospital, to 0.6 gramme per day. The hæmoglobin value had fallen to 5.0 grammes per centum by the third day, the erythrocytes numbered 2,400,000 per cubic millimetre, and examination of a blood film revealed anisocytosis, poikilocytosis, polychromasia and many late erythroblasts and normoblasts. The leucocytes numbered 10,000 per cubic millimetre. Examination of the urine revealed a heavy cloud of albumin, some granular casts, and an increased amount of urobilin, but no bile pigments or hæmoglobin. The Van den Bergh test produced an immediate direct positive reaction.

A tentative diagnosis of pneumonia with acute hæmolytic anaemia of unknown origin was made, and blood was taken for cultural examination. Penicillin administration was begun and frequent blood transfusions were given. Culture from the blood produced a growth of *Salmonella blegdam*.

A generalized tetanic spasm occurred on the fourth day and was relieved by the intravenous administration of

calcium gluconate. Lumbar puncture revealed normal cerebro-spinal fluid under increased pressure. One intravenous injection of quinine hydrochloride was given, but at no stage of the disease were malaria parasites seen. The results of a red blood cell fragility test were within normal limits. No sickle cells were seen in suitably prepared wet films.

On the seventh day, the spleen, which was not palpable earlier, was enlarged and tender, but the liver was not palpable. Repeated blood transfusions failed to raise the hæmoglobin value above nine grammes per centum. Although there was no evidence of hæmorrhage, the hæmoglobin value fell at the rate of one gramme per centum per day, and jaundice increased.

Salmonella blegdam was again isolated from the blood on the eighth day, and two days later the patient died. With the exception of two remissions on the mornings of the fourth and fifth days, fever was continuous, the temperature reaching a maximum of 105° F.

A post-mortem examination was carried out by Major H. O. Lancaster seven hours after death. The principal findings were deep jaundice, moderate splenomegaly, and submucosal hæmorrhages and erosions in the colon. *Salmonella blegdam* was isolated from the spleen and colon.

The body was that of a young, emaciated native, deeply jaundiced. Examination of the lungs revealed hypostatic congestion, and there was no free fluid in the pleural cavities. The heart was normal. There was no free fluid in the peritoneal cavity. The liver was normal in size and had the "nutmeg" appearance of early chronic venous congestion. The gall-bladder and bile ducts were normal. The spleen was moderately enlarged and soft; *Salmonella blegdam* was isolated from it. The pancreas and suprarenals were normal. The kidneys were congested, and the bladder appeared normal. The small intestine was normal throughout, and there was no swelling of Peyer's patches. In the ascending and descending colon submucous hæmorrhages up to seven millimetres in diameter were present, occurring especially at the summits of folds or over areas of œdema. The bowel wall was thickened, especially in the descending colon. Shallow erosions up to three millimetres in diameter were found in the affected areas. *Salmonella blegdam* was isolated from swabs taken from these erosions. The lymph nodes were normal.

CASE N IX.—The patient was a native of Wain, a youth of small stature and poor physique, aged about eighteen years. He was admitted to the Native Hospital at Lae on September 21, 1945, suffering from bacillary dysentery. The spleen was just palpable. *Shigella shiga* was isolated from the stool, and the patient was treated with sulphaguanidine, three grammes every four hours. General improvement was apparent soon after his admission to hospital, but he continued to pass blood and mucus in the stools for another twelve days. The dosage of sulphaguanidine was then halved, but with the recurrence of mucus in the stools ten days later, full dosage was restored. There was little change in the patient's condition until the thirty-first day after his admission to hospital, when the evening temperature rose to 101° F. and a maculopapular rash developed on the trunk, face, neck and limbs. (In Table I and the ensuing text, the "day of disease" is dated from this day, thirty-two days after the onset of Shiga dysentery.)

In view of the heavy dosage and continued administration of sulphaguanidine (450 grammes in thirty days), the fever and rash were first regarded as a reaction to this drug, which was now discontinued. However, the fever persisted, ranging for the first seven days between 101° and 105° F., then gradually subsiding, to be followed by intermittent pyrexia for the remainder of the illness. The rash became vesicular, and ten days after its appearance desquamation commenced, progressing to a severe exfoliative dermatitis which remained active until the patient's death. His condition deteriorated rapidly during this period, with extreme loss of weight and increasing pallor. Nine days after the onset of the fever the liver and spleen were enlarged, and the patient was jaundiced. He complained of constant pain in the left loin. Only slight tenderness was present in this region and there was no disturbance of micturition. However, the urine contained

TABLE I.

Case Number.	Age and Sex of Patient.	Locality.	Days of Fever.	Cultural Investigations. ¹										Leucocytes per Cubic Millimetre.		Hæmoglobin (Grams per Cent).	Remarks.
				Blood.		Fæces.		Urine.		Other Material.							
				Day.	Result.	Day.	Result.	Day.	Result.	Material.	Day.	Result.	Day.	Result.			
N. I	Adult male.	Port Moresby.	Nil.				+										
N. II	Male child, 2 years.	Bougainville Island.	3 days, then 16 days without fever, then 3 days fever.			3 22 26 27 32	P +P P P N										
N.III	Adult male.	Port Moresby.	?	?	+												
N.IV	Adult male.	Finschhafen.	17	12	+	17 20 27	-P -P -N	14 17 20 22	- -P -N				12	8,400			
N. V	Adult male.	Dobadura.	?														
N. VI	Adult female.	Bougainville Island.					P			Abscess of thigh. Breast abscess.	?	+					
N.VII	Male, 17 years.	Mount Hagen, (Lae Hospital).	12	3 9	+	4	-P	3 6	-N -N	Cerebro-spinal fluid.	3 6	-N(a) -N	2 6 13	11,800 4,700 22,800	2 4 6 15	P.m. - - -	
N.VIII	Male, 18 years.	Mount Hagen (Lae Hospital).	10	3 8	+	-13 -3	P(a) -N	3	- Albumin + Urobilin + Bile pigments -	Cerebro-spinal fluid, spleen, colon.	7	-N(b)	-16 3 5	8,900 10,100 7,000	-16 3 5 6 7 8 9	- - - - - - -	
N.IX	Male, 18 years.	Wain (Lae Hospital).	55	10	-	-31 -20 3 12 15 20 29 53	P(a) P -P -P -P -P -P +P	8 13 17 17 33 52 54	P P Bilirubin + P Bilirubin + N P +P	Spleen.	Post mortem.	+	-31 1 9 13 30 41 48 54	8,000 7,800 10,300 6,000 29,500 23,300 15,000 8,000	-31 1 2 9 19 29 37 41 48 53	- - - - P.R. - - - - -	
N.X	Male, 20 years.	Bena Bena (Lae Hospital).	9	8	+					Cerebro-spinal fluid, spleen.	6	-N(a)	4 7	5,500 3,500	4	P.f. -	
N.XI	Male, 16 years.	Timbe (Lae Hospital).	10			9	-P			Spleen, kidney.	Post mortem.	+	8	3,800	8	P.f.	
N.XII	Adult female.	Bougainville Island.	? 60			14	-	? 12 40 60	+P +P +P	Lung, spleen, bowel, kidneys.	Post mortem.	+	+	+	+		
N.XIII	Child.	Bougainville Island.	Nil.							Small bowel.	Post mortem.	+					
N.XIV	Adult female.	Bougainville Island.	? 60	? 14	+			? 14 38 60	+P +P +P	Spleen, kidneys.	Post mortem.	+	+				
LI	Adult female.	Morotai.	2			5 17 20 5	+N -N -N -P	11	-				11	11,600	11	-	
LII	Adult male.	Sydney.	?	6	+			10	+P				5	5,100			

¹ All cultural examinations: "+" = *Salmonella boydii* isolated; "-" = *Salmonella boydii* not isolated. Fæces: "N" = stool normal macroscopically and microscopically; "P" = stool abnormal macroscopically and microscopically. Urine: "N" = urine microscopically normal; "P" = abnormal cellular deposit in urine; neither "N" nor "P" is indicated, no data were available. Malaria parasites: "P.v." = *Plasmodium vivax*; "P.f." = *Plasmodium falciparum*; "P.m." = *Plasmodium malarium*. The letters (a), (b), (c) et cetera refer to the corresponding entries in the "Remarks" column of this table.

bilirubin, pus and red blood cells. Unfortunately, no cultural examination of the urine was attempted at this stage of the illness.

Sigmoidoscopy fourteen days after the onset of the rash and fever revealed hyperæmia, shreds of mucus and small superficial erosions in the lower part of the sigmoid colon. Microscopic and cultural examination of the fæces and of a piece of mucus removed at sigmoidoscopy failed to disclose any pathogenic organisms.

Cheilosis and angular stomatitis developed, and the tongue became red, with flattening of the filiform papillae. Vitamin preparations, liver extract and iron were adminis-

tered by mouth and parenterally. The liver continued to enlarge, and jaundice increased. A course of emetine hydrochloride, one grain per day for ten days, was followed by a decrease in the jaundice, but by no improvement in the patient's condition.

The hæmoglobin value of the blood fell from 13.5 grammes to 5.5 grammes per centum in nineteen days, without any apparent hæmorrhage. Blood transfusions were given and the hæmoglobin content rose to 12.0 grammes per centum. However, it fell to 8.6 grammes within four days, and the hæmolytic process continued until the patient's death. In the blood film pronounced

TABLE I.

No.	Day.	Result.	Complications.		Remarks.
			Week.	Type.	
					<i>Salmonella blegdam</i> isolated from a healthy individual during a rectal swab survey of a native labour camp.
					Admitted to hospital with diarrhoea and fever. Stools became normal and temperature subsided after three days and remained so for 16 days. Then fever and diarrhoea recurred and <i>Salmonella blegdam</i> was isolated from the faeces.
					History of salmonella fever with no complications.
00			Second.	? Left epididymo-orchitis.	Admitted to native hospital with "bronchitis". During the second week an abscess of the left side of the scrotum developed and he was transferred to a military hospital. " <i>Bacterium enteritidis</i> " (never proved to be <i>Salmonella blegdam</i>) was isolated on blood culture. Left epididymo-orchietomy was performed, but only <i>Staphylococcus aureus</i> was isolated from the pus.
				? Abscess of breast; death.	Cause mentioned by Lawes and Keon-Cohen. ⁽¹⁷⁾
					Mother nursing an infant was admitted to the native hospital with a breast abscess, which did not respond to penicillin or sulphadiazine therapy. Aspiration of abscess was performed and <i>Salmonella blegdam</i> was isolated from the pus. A few days later the patient died, and no post-mortem examination was made.
00	2	P.m.	First.	Coma with strabismus, slight jaundice.	(a) Cellular, protein and chloride contents of cerebro-spinal fluid within normal limits. Admitted to hospital with symptoms and signs of right basal pneumonia. Became drowsy and then comatose on the third day and showed signs of involvement of the cranial nerves. Slightly jaundiced from third day. On third week, after defervescence, motor aphasia was evident, which persisted for about two months.
00	4	—	Third.	Motor aphasia.	
00	15	—			
00	—	—	First.	Hæmolytic anemia and jaundice.	(a) <i>Shigella shigæ</i> isolated.
00	—	—	Second.	Death.	(b) Cellular, protein and chloride contents of cerebro-spinal fluid within normal limits. Admitted to hospital with bacillary dysentery, which was cured after a fortnight's treatment with sulphaguanidine and sulphapyridine. High fever, with anemia and jaundice, supervened and the patient died on the tenth day after treatment with blood transfusions, quinine intravenously, and penicillin. The principal post-mortem findings were jaundice, splenomegaly, and submucous hemorrhages and erosions in the colon, <i>Salmonella blegdam</i> being isolated from the spleen and from the erosions in the colon.
00	—	—	First.	Hæmolytic anemia and jaundice.	(a) <i>Shigella shigæ</i> isolated.
00	—	—	Second.	Exfoliative dermatitis.	Admitted to hospital with severe bacillary dysentery and treated for four weeks with a total amount of 450 grammes of sulphaguanidine. Thirty-one days after admission to hospital had recovered from dysentery, but developed a rash and became feverish, anemic, jaundiced. Developed cystitis, passing blood and pus in the urine. The rash progressed to severe exfoliative dermatitis. Treated with blood transfusions, vitamin preparations, emetine, and penicillin, but died on 55th day of febrile illness. The principal lesions found post mortem were ulcerated skin, hemorrhagic cystitis, and slight inflammation of the colonic mucosa.
00	—	—	Sixth.	Superficial abscesses.	
00	—	—	Eighth.	Death.	
00	—	—	First.	Jaundice.	(a) Cellular, protein and chloride contents of cerebro-spinal fluid within normal limits. Admitted to hospital with fever, headache, pain in chest. Blood film showed <i>Plasmodium falciparum</i> . Treated with sulphamerazine and "Atebrin". Became delirious, and was treated as suffering from cerebral malaria. Became deeply jaundiced and comatose and died. The principal post-mortem findings were jaundice, small subpleural and epicardial hemorrhages, and an enlarged soft spleen from which <i>Salmonella blegdam</i> was isolated.
00	—	—	Second.	Death.	Admitted to hospital after a week's illness with fever, headache and pains in the back. Blood film showed <i>Plasmodium falciparum</i> . Treated as suffering from cerebral malaria. Became irrational, hit head against wall, became comatose, and died. Post-mortem examination showed subarachnoid hemorrhage in left parietal region, small subpleural hemorrhages over both lungs, an enlarged friable spleen, and gross infection of the urinary tract.
00	—	—	Second.	Cystitis.	Admitted to hospital after about a fortnight's illness with fever. Cystitis due to <i>Salmonella blegdam</i> was present on admission. Febrile course continued with various complications developing for a further six weeks, when she died. At the post-mortem examination the spleen was enlarged and contained an abscess. There were abscesses also in the mediastinal and mesenteric lymph nodes. The bowel wall was thickened and there were numerous small ulcers on the folds. The base of the left lung was consolidated. The kidneys were large and pale and there was pus in the pelvises. <i>Salmonella blegdam</i> was isolated from all of these abscesses and from the pus in the kidney pelvis.
00	—	—	Second.	Cystitis.	Admitted to hospital with history of constipation which was not relieved by enemata or purgatives. Exploratory laparotomy was performed two days after admission to hospital and the patient died while under the anæsthetic. The abdominal incision was extended and the abdominal contents were examined, but the only abnormal feature observed was the total collapse and flattening of about six inches of the small bowel. When opened this area was gangrenous and <i>Salmonella blegdam</i> was isolated from it.
00	—	—	Second.	Cystitis.	Admitted to hospital after a fortnight's illness with fever. Cystitis present on admission. Prolonged febrile illness followed, with death about two months after the onset. Post mortem there were multiple abscesses in the kidney substance and in the spleen.
00	—	—	Second.	Cystitis.	Admitted to hospital with a history of slight fever, colicky abdominal pain and vomiting. Recovered without incident.
00	—	—	Second.	Cystitis.	Admitted to hospital with a history of fever, headache and malaise, of two days' duration. Became very ill, passed "pea soup" stools. Both liver and spleen were enlarged. Cystitis occurred in second week.

anisocytosis and polychromasia were apparent, and the anaemia was of the hypochromic, normocytic type.

Penicillin was given by intermittent intramuscular injection between the thirty-third and the fortieth day, without effect. Subcutaneous abscesses and subsequent sloughing ulceration occurred at all the sites of blood transfusion, and an abscess developed in the left gluteal region on the forty-second day. Material from these ulcers was not examined by cultural means, but there was a considerable leucocytosis coincident with their occurrence.

This patient was not given suppressive "Atebrin" treatment. After many negative results to blood film examinations, *Plasmodium vivax* trophozoites were found on the forty-first day, and "Atebrin" (0.6 gramme per day) was given, but there was no improvement.

The final picture was that of a cachectic native with extensive exfoliative dermatitis and weeping fissures in the axillæ and groins, with unhealed sloughing ulcers in both cubital fossæ, on the medial side of both ankles and on the left buttock, with angular stomatitis and œdema of the scrotum. He was passing semi-formed stools flecked with blood, and urine containing pus and blood. *Salmonella blegdam* was isolated from the stool and urine during the last few days before death, which occurred eighty-six days after his admission to hospital and fifty-five days after the onset of fever and dermatitis.

A post-mortem examination was carried out five hours after death. The principal lesions found were the ulcerated and scaly skin, slight inflammation of the descending colon, and hæmorrhagic cystitis.

The body was that of a young adult in a poor state of nutrition. The skin was scaly and was ulcerated at the corners of the mouth and eyes and in the limb flexures. A superficial bed sore was present over the sacrum, and an incision in the left buttock drained a small abscess. Localized fibrous adhesions were present over the upper portion of the upper lobe of the right lung. Both lungs were normal in appearance. The heart and pericardium were normal. There was a little free fluid in the peritoneal cavity, and the greater omentum and mesentery both contained little fat. The liver was slightly enlarged and of "nutmeg" appearance. On section, the liver was found to be slightly oedematous and congested, and a considerable amount of malarial pigment was present in the macrophages of the hepatic sinuses. The gall-bladder was normal. The spleen was enlarged and fairly firm. The splenic substance appeared normal, but *Salmonella blegdam* was grown from it. Both kidneys were pale, with a little thinning of the cortex and an increase in pelvic fat. The ureters and pelvises were normal. The mucous membrane of the bladder was oedematous, and extensive areas of submucous hæmorrhage and superficial ulceration were present. The stomach and the small intestine appeared normal on macroscopic examination. The wall of the colon was oedematous, the mucous membrane was slightly inflamed, and small hæmorrhagic spots were present, most definite in the descending colon. No ulceration was seen. The mesenteric lymph nodes were not enlarged.

CASE N X.—The patient, a native of Bena Bena, was a stocky, well-built man, aged twenty years. He was admitted to the Native Hospital, Lae, on November 2, 1945, with a history of continuous high fever with headache, cough, and pain in the chest, of three days' duration. On his admission to hospital his temperature was 105.2° F., his pulse rate was 120 per minute and his respirations numbered 20 per minute. Some crepitations were audible in the right infrascapular region, and tenderness was elicited under the left costal margin, although the spleen could not be felt. Examination of the blood revealed many trophozoites of *Plasmodium falciparum*. Treatment with full doses of sulphamerazine and "Atebrin" was commenced, but no improvement ensued. Four days after the patient's admission to hospital the spleen was palpable and tender, and jaundice was noticeable, although the liver could not be felt. He became delirious, and had oliguria and neck stiffness. The cerebro-spinal fluid was under normal pressure and contained no abnormal constituents. Repeated examinations of blood films at this stage failed to reveal any malaria parasites; but in view of the leucopenia, the negative findings on lumbar puncture and the presence of *Plasmodium falciparum* several days earlier, cerebral malaria was considered the most likely diagnosis, and quinine was given intravenously, sulphamerazine therapy being stopped. However, his condition became worse, and blood was taken for cultural examination. Penicillin therapy was commenced. The blood yielded a growth of *Salmonella blegdam*, but the result was not available until after the patient's death on the ninth day of the illness. Prior to death he was deeply jaundiced, stuporose and incontinent of faeces and urine.

A post-mortem examination was carried out about eight hours after death, and the principal lesions then detected were small subpleural hæmorrhages over both lungs and small clusters of hæmorrhages beneath the epicardium. The spleen was large, and the splenic pulp was soft, homogeneous and dark in colour. Gram-negative bacilli, which proved to be *Salmonella blegdam*, were found in smears from the spleen. The abdominal contents were tinted yellow.

The surface of the brain appeared a little congested, and small areas of hæmorrhage were seen in the pia-arachnoid scattered over the cerebral cortex and the upper surface of the cerebellum. No malaria parasites were seen in smears from the cerebral cortex or cerebellum.

A few adhesions were present at the apex of the right lung, and subpleural hæmorrhages up to four millimetres in diameter were scattered over the surface of both lungs. Apart from hypostatic congestion, the lung parenchyma and the bronchi were normal. The pericardial cavity con-

tained a few millilitres of clear fluid. There were clusters of hæmorrhages on the surface of the epicardium similar to those seen on the lungs, and they were most obvious on the posterior surface of the heart. The myocardium appeared normal. There was no free fluid in the peritoneal cavity, but all the viscera were tinted yellow. The liver was normal in size and appearance, except for three small patches of hæmorrhages, each about eight millimetres in diameter. The gall-bladder and bile ducts were normal, and the latter contained dark bile normal in appearance. The pancreas was normal. The spleen was large and congested, the splenic pulp being soft, homogeneous and dark in colour. Examination of smears from the splenic pulp failed to reveal any plasmodia, but Gram-negative bacilli, proved by culture to be *Salmonella blegdam*, were present. The kidneys appeared normal except for petechial hæmorrhages in both pelvises. The bladder wall was normal in appearance, and the bladder contained about 50 millilitres of clear urine. The only abnormal finding in the gastro-intestinal tract was a few hookworms in the jejunum. The lymph nodes were normal.

CASE N XI.—The patient, a native of Gamada, Timbe, was a small well-developed youth, aged about sixteen years. He was admitted to the Native Hospital at Lae on January 16, 1946, with a history of fever, headache, and pains in the back, of one week's duration. On his admission to hospital he was drowsy and too weak to stand up. His temperature was 102° F., his pulse rate was 80 per minute, and his respirations numbered 30 per minute. The spleen was enlarged but not tender, the throat was injected, and scattered rhonchi were heard in the chest; there was an area of diminished vesicular murmur in the lower lobe of the right lung. *Plasmodium falciparum* trophozoites were found in the blood film, and the patient was treated as suffering from cerebral malaria. Later he became irrational, thumping his head violently against the wall, and next day he became stuporose, passed frequent watery stools, and died forty hours after his admission to hospital.

A post-mortem examination was carried out five hours after death. The principal lesions found were subarachnoid hæmorrhage over the left parietal region, a large, dark-red, very friable spleen, and evidence of gross infection of the pelvises of the kidneys, the ureters and the bladder. *Salmonella blegdam* was isolated from the kidneys and spleen.

No fracture of the skull was present, but there was a subarachnoid hæmorrhage in the left parietal region, mainly over the vertex, and extending over the surface of the temporal lobe. The brain surface beneath was congested and showed small petechial hæmorrhages.

Adhesions were present over the upper lobe of the right lung, and examination of the lungs revealed hypostatic congestion, with frothy mucus in the bronchi. A small calcified subpleural nodule was present in the lower lobe of the left lung, and small subpleural hæmorrhages were found over both lungs. The heart and pericardium were normal except for the presence of a few millilitres of clear yellow pericardial fluid. There was no free fluid in the peritoneal cavity. The liver was of normal size. The surface was smooth and mottled, with pale areas and areas of congestion. The cut surface was firm and yellowish. The gall-bladder was normal. The pancreas was normal. The spleen was enlarged to twice its normal size, and the splenic pulp was dark in colour and friable. *Salmonella blegdam* was isolated from the spleen. Both kidneys were small and congested. Petechial hæmorrhages were present in the pelvis of each kidney, and *Salmonella blegdam* was isolated from swabs taken from the pelvis. The bladder contained turbid urine, and examination of the bladder revealed extensive hæmorrhage and inflammation. The left suprarenal gland was swollen and hæmorrhagic. The only abnormal findings in the gastro-intestinal tract were a Meckel's diverticulum and three adult *Ascaris lumbricoides* worms in the colon. The lymph nodes were normal.

Smears from the brain, spleen and kidney were examined for malaria parasites and for bacteria. No plasmodia were seen, although malaria pigment was present in the splenic smear. Numerous Gram-negative bacilli were found in the

smear from the kidney pelvis and a few in the splenic smear, and these proved on culture to be *Salmonella blegdam*.

Two Cases in Australian Service Personnel.

The following two cases are briefly described here because the patients were infected in Australia and in Morotai, whence human infections with *Salmonella blegdam* have not yet been reported.

CASE L I.—The patient was a member of the Australian Army Medical Women's Service, on the staff of an Australian general hospital in Morotai. She suffered from a mild attack of abdominal pain, vomiting and slight fever. The attack lasted only four days, but *Salmonella blegdam* was isolated from her stools on one occasion.

Although careful search had been made for salmonella in the two Australian general hospitals on Morotai in the eight months during which they functioned there, *Salmonella blegdam* was not isolated on any other occasion.

CASE L II.—The patient was an Australian infantryman who had been in the Aitape-Wewak area until December, 1945. He arrived at Sydney in January 15, 1946, and went on leave at Newcastle, New South Wales. Eight days after reporting back from leave, on February 17, 1946, he became ill and suffered an attack of salmonella fever complicated by cystitis. *Salmonella blegdam* was isolated from his blood and urine. This attack commenced at least six weeks after he had left New Guinea, the patient being a man who had been in good health for at least two months previously, and it is probable that the infection was contracted in Australia.

Discussion.

The cases of *Salmonella blegdam* infection described in this paper came from two groups of natives with different degrees of medical supervision. Most of the adult males were members of the native labour corps administered by the Australian army. They lived in large compounds near military camps at Port Moresby, Lae, Dobadura and Finschhafen, and during the daily inspections of the camp lines sick men were sent to hospital for treatment. The women and children came from a refugee camp, established at Torokina on Bougainville Island to house native families from villages in the Japanese-occupied interior. These people were never brought to hospital for treatment until they were really ill, often many days after the onset of the disease.

In both groups short febrile illnesses, or cases of diarrhoea without the passage of blood and mucus were not investigated bacteriologically and hence mild cases of salmonella infection were only rarely diagnosed.

Bornstein⁽⁶⁾ has emphasized that human infection with members of the salmonella group may cause salmonella fever, septicæmia with localization of infection or gastro-enteritis, regardless of the species of organism which causes the infection, but with differences in the relative incidence of the different clinical types which do depend on the species of organism. In the present series of cases in New Guinea natives there was one healthy carrier, one patient with gastro-enteritis, four patients with salmonella fever, and five patients with septicæmia with various local manifestations. In two cases the presenting symptom was an abscess, and one case (number N XIII) cannot be classified on the information available. Of the two new cases in Australian service personnel, one was a case of gastro-enteritis and the other a case of salmonella fever complicated by cystitis.

As we have pointed out earlier, natives suffering from mild salmonella fever or gastro-enteritis were either not admitted to hospital or not carefully investigated bacteriologically. This series of cases cannot therefore be considered a representative sample of *Salmonella blegdam* infections in natives of New Guinea. Nevertheless, it supports the impression gained earlier⁽³⁾ that *Salmonella blegdam* only rarely causes gastro-enteritis. Salmonella fever with bacteriæmia and often with local septicæmic manifestations appears to be the usual form of human infection.

The mortality rate in this series was high. Four of the five cases among natives admitted to hospital from the

refugee compound on Bougainville Island were fatal, as were four of the five cases among those admitted to hospital from the native labour compound at Lae.

Between July and September, 1945, about a thousand natives from mountain villages in the Wain, Bena Bena, Mount Hagen and Timbe districts of New Guinea were brought to the native labour camp at Lae, where they were quartered with some 4,000 natives from coastal villages. Many suffered severely from malaria and dysentery, diseases to which the lowland natives had acquired considerable immunity. The only cases of *Salmonella blegdam* infection diagnosed in natives at Lae between September, 1943, and January, 1946, occurred in men who had come down from these mountain districts one or two months earlier, and all were severe, four out of five being fatal. Two of these patients were admitted to the native hospital at Lae with Shiga dysentery, and symptoms of *Salmonella blegdam* infection appeared thirteen and thirty-one days respectively after their admission to hospital, although *Salmonella blegdam* had not previously been isolated in the hospital.

In each of the five cases from Lae the *Salmonella blegdam* infection was preceded or complicated by another infection—Shiga dysentery in two, falciparum malaria in two, and quartan malaria in one. The two patients who were admitted to hospital with Shiga dysentery had severe attacks, and the resultant loss of weight and debility may have contributed to their failure to survive the subsequent *Salmonella blegdam* infection. Antimalarial therapy was commenced soon after the admission of the other patients to hospital, and the parasites quickly disappeared from the blood-stream; but the expected improvement in condition did not occur.

Jaundice developed in four of these cases at Lae, being severe and progressive in three and transient in the other. In each case there was a simultaneous and rapid fall in the hæmoglobin content of the blood without any evidence of internal or external hæmorrhage. The blood picture was that of normochromic or hypochromic anaemia with considerable polychromasia, and in one case (number N VIII) nucleated red cells were found in the blood films. The fall in hæmoglobin value continued in two cases in spite of repeated transfusions of fresh whole blood.

Havens and Wenner⁽⁶⁾ noted the frequent association of jaundice with salmonella infection described just after the first World War, and themselves described two cases of salmonella fever due to *Salmonella cholerae-suis* which occurred at the same time as the jaundice resulting from the experimental inoculation of the virus of infective hepatitis. They suggest that in addition to the fact that both types of infection are spread by the intestinal-oral route, the virus of infective hepatitis may render bacterial invasion of the intestinal tract more likely than that of a normal, healthy individual. Fenner and Jackson⁽⁷⁾ mentioned three cases in which infective hepatitis preceded or accompanied an attack of salmonella fever due to *Salmonella blegdam*.

However, in none of the present cases was virus hepatitis the cause of the jaundice. Furthermore, no cases of infective hepatitis were seen in the native hospital at Lae during 1945.

In Case N IX bilirubin was found in the urine on two occasions, and there was an immediate direct response to the Van den Bergh test. At autopsy, examination of the liver of this man, as of the others who died, revealed only the "nutmeg" appearance of chronic venous congestion. Section of the liver revealed slight congestion and oedema and a considerable amount of pigment in the macrophages of the hepatic sinuses.

It seems certain that the major cause of the jaundice in all our cases was intravascular hæmolysis. In three cases the resultant hæmolytic anaemia was severe enough to be an important contributory factor to death.

All the patients received sulphonamide therapy, and the possibility that these drugs caused the hæmolytic anaemia must be considered. However, these four men with *Salmonella blegdam* septicæmia were the only patients out of hundreds of natives who received sulphonamides to develop hæmolytic anaemia, the jaundice was in two

cases evident within three days of the first administration of the drug, and in three cases, after its administration was stopped, hæmolysis continued until death. In no case did the leucocytes show evidence of the toxic effects of sulphonamides on the bone marrow.

Hæmolytic anaemia has not been described in any other cases of *Salmonella blegdam* infection, and only three reports of its association with salmonella infections have been found. Berman, Braun, and Rachmilewitz⁽¹⁰⁾ described nine cases of hæmolytic anaemia in 152 cases of typhoid fever in Palestine. The hæmolytic process in these cases was in general similar to that seen in our cases, but was not so severe. Davidson and Fullerton⁽¹¹⁾ described a case of severe macrocytic hæmolytic anaemia associated with an attack of *Salmonella dublin* septicæmia. They thought that the case was one of latent hæmolytic anaemia precipitated into a blood crisis by a salmonella infection. Croscia,⁽¹²⁾ whose work is available to us in abstract only, mentions that in occasional cases of typhoid fever gross hæmolytic anaemia occurs from the lysis of erythrocytes by typhoid bacilli.

Fragility tests and examinations of wet blood films for sickle cells were carried out in some of our cases; but there were no signs of either increased fragility or of sickling of the red cells.

In these cases it seems that hæmolysis was caused by infection with *Salmonella blegdam*. Miss Nancy Atkinson is at present investigating the hæmolytic power of the strains obtained from these cases. Her preliminary experiments have given negative results.

The other interesting clinical features are the exfoliative dermatitis seen in Case N IX and the cerebral signs in Case N VII. Sulphaguanidine therapy may have caused the exfoliative dermatitis. The only other case of exfoliative dermatitis associated with *Salmonella blegdam* infection was one of Fenner and Jackson's⁽⁹⁾ cases, which they thought was due to quinine sensitivity. The patient in Case N IX had never received "Atebrin" until the forty-first day of the disease, when he developed malaria.

In Case N VII transient strabismus occurred in a semi-comatose patient at the height of the illness. The cerebrospinal fluid was normal. Motor aphasia was noticed during the convalescence, and persisted for several weeks after recovery from the acute illness. Small hæmorrhagic spots were seen on the cerebral cortex in Cases N X and N XI, which ran a rapid course, and it is possible that a small localized hæmorrhage or thrombosis occurred near the speech centre of the patient in Case N VII.

In patients who died in the second week of the illness, the principal lesions found at post-mortem examination were those usually associated with acute septicæmia—namely, petechial hæmorrhages on the pleura, epicardium, kidney pelvises and cerebral cortex, and an enlarged, soft, friable spleen. As in Fenner and Jackson's⁽⁹⁾ series, in which cystitis was the commonest complication, so in four of the fatal cases of this series (numbers N IX, N XI, N XII, and N XIV) in which symptoms of cystitis were present during life, severe hæmorrhagic ulceration of the bladder was found *post mortem*. In the last two cases, pus was also found in the kidney pelvis (N XII) and multiple abscesses were present in the kidney substance (N XIV).

In a recent description of fatal cases of salmonella infection, Angrist and Molloy⁽¹³⁾ describe hyperplastic Peyer's patches in only two cases of *Salmonella typhimurium* infection out of nine cases of fatal salmonella infection (three of *Salmonella typhimurium* infection, three of *Salmonella cholerae-suis* infection, one each of *Salmonella lightfield* infection, *Salmonella newport* infection and *Salmonella montevideo* infection). In none of our cases was any abnormality of the small intestine seen. In Case N VIII, in which Shiga dysentery preceded the attack of salmonella septicæmia, submucous hæmorrhages were found in the colon. *Salmonella blegdam* was also isolated from small ulcers in the colon in Case N XII; the patient had not suffered from dysentery.

The tissues of all the jaundiced patients were deeply bile-stained. Small subcapsular hæmorrhages were seen on the liver in Case N X, and in the other cases the only abnormality in the liver was a "nutmeg" appearance.

In Cases N XII and N XIV, in which the patients were ill for weeks before death occurred, abscesses were found in many of the internal organs.

Summary.

1. The clinical and pathological features of 14 cases of *Salmonella blegdam* infection in New Guinea natives are tabulated, and the clinical histories and post-mortem findings in four fatal cases at Lae are fully described.

2. As in Australian soldiers, infection usually causes salmonella fever or septicæmia, although one patient with salmonella gastro-enteritis and one healthy carrier were seen.

3. Severe acute hæmolytic anaemia was a feature of several cases in natives from the mountain villages behind Lae.

4. The post-mortem findings in the cases in which death occurred in the second week were those of acute septicæmia, accompanied by jaundice in some cases and cystitis in others. When the infection had been more prolonged, widespread abscesses and involvement of the urinary tract were features of the post-mortem examination. Peyer's patches always appeared normal, but hæmorrhages and small erosions occurred in the mucosa of the colon in one case in which *Salmonella blegdam* infection followed an attack of Shiga dysentery and in one other case.

5. Two cases of *Salmonella blegdam* infection in Australian service personnel infected in Morotai and in Australia respectively are briefly described.

Acknowledgements.

We have to thank Miss Nancy Atkinson, of the Institute of Medical and Veterinary Science, Adelaide, for identifying the salmonella strains. Major H. O. Lancaster and Lieutenant R. W. Irvine carried out most of the laboratory examinations on the patients treated at the Lae Native Hospital, and Major J. Garvan and Lieutenant R. Wright supplied notes on several of the other cases included in this report. We are indebted to Dr. E. Ford and Dr. R. R. Andrew for their advice and criticism.

References.

- (1) F. Kauffmann "Über die Typeneinteilung der Gärtnereigruppe", *Zeitschrift für Hygiene und Infektionskrankheiten*, Volume CXVII, 1936, page 431.
- (2) N. Atkinson, G. M. Woodroffe and M. Macbeth: "The Occurrence of *Salmonella* Types in Australia", *The Australian Journal of Experimental Biology and Medical Science*, Volume XXII, 1944, page 201.
- (3) F. Fenner and A. V. Jackson: "Enteric Fever Due to Bacterium Enteritidis Var. Blegdam (*Salmonella Blegdam*): A Series of Fifty Cases in Australian Soldiers from New Guinea", *THE MEDICAL JOURNAL OF AUSTRALIA*, March 9, 1946, page 439.
- (4) J. G. C. C. Cobley and T. E. Wilson: "Report of a Case of *Salmonella Blegdam* Septicæmia and Suppurative Pericarditis with Recovery", *THE MEDICAL JOURNAL OF AUSTRALIA*, March 30, 1946, page 439.
- (5) N. Atkinson: "Preliminary Report on Strains of *Salmonella Blegdam* Causing Infection in Humans in New Guinea", *THE MEDICAL JOURNAL OF AUSTRALIA*, March 9, 1946, page 326.
- (6) R. B. Stevens: "The Occurrence of *Salmonella Blegdam* in the Philippines", *The Journal of Bacteriology*, Volume LII, July, 1946, page 146.
- (7) C. H. W. Lawes and B. T. Keon-Cohen: "Papuan Interlude", *THE MEDICAL JOURNAL OF AUSTRALIA*, Volume II, 1944, page 356.
- (8) S. Bornstein: "The State of the *Salmonella* Problem", *The Journal of Immunology*, Volume XLVI, 1943, page 439.
- (9) W. P. Havens and H. A. Wenner: "Infectious Hepatitis Complicated by Secondary Invasion with *Salmonella*", *The Journal of Clinical Investigation*, Volume XXV, January, 1946, page 45.
- (10) S. E. Berman, K. Braun and M. Rachmilewitz: "Hæmolytic Anaemia in Typhoid Fever", *Acta medica orientalia*, Volume IV, June, 1945, page 175.
- (11) L. S. P. Davidson and H. W. Fullerton: "Some Rare Types of Macrocytic Anaemia", *The Quarterly Journal of Medicine*, Volume VII, 1938, page 43.
- (12) A. Croscia: "Sul comportamento del ricambio emoglobinico nel tifo", *Clinica pediatrica*, Volume XXVIII, 1946, page 112; abstracted in *Abstracts of World Medicine*, Volume I, February, 1947, page 205.
- (13) A. Angrist and M. Molloy: "Bacteriologic, Clinical and Pathologic Experience with 86 Sporadic Cases of *Salmonella* Infection", *The American Journal of the Medical Sciences*, Volume CXXII, 1946, page 336.

Reviews.

MENTAL NURSING.

SENIOR SISTER TUTOR at the famous Crichton Royal Mental Hospital, Dumfries, the author of "The Practice of Mental Nursing",¹ May Houlliston, R.G.N., R.M.N., R.F.N., offers an approach to the subject which is obviously the result of long experience with the average trainee mental nurse to whom the subject must be presented simply and realistically, with a minimum of unnecessary academic knowledge.

Of the 159 pages of text, only 35 are devoted to a discussion of psychology, causation and symptomatology of mental disorders, but these subjects are presented succinctly and clearly, and there are few omissions at which one could cavil. A more detailed description of schizophrenia is necessary, and space could be given with advantage to a discussion of organic dementia, and of the so-called puerperal psychoses.

The discussion of the management of the patients is wisely devoted to the management of the various tendencies in the patients in general rather than to individual diseases, and this section is obviously based on long personal knowledge of the details of ward life. It is difficult to recall any aspect of a nurse's duties that is not adequately dealt with in this chapter, and in the following chapters on special duties, night duties and admission of patients. A special chapter on the bathing of patients is included, but it is hoped that those in charge of mental hospitals will not accept the advice that general bathing should be carried out once a week.

The importance that has been conceded to occupational therapy at last is to be recognized by the fact that seventeen pages are devoted to this subject; it is obvious that not only the occupational therapists, but the nursing staff in general must be able to play their part in the wide ramifications of this form of treatment.

Probably the best chapter is that on the essential qualities of the mental nurse, with its insistence that her first duty is always to her patients. This chapter might with advantage be made compulsory reading in each of the three years of the course for mental nurses. The book itself should be read not only by the junior nurse for whom it is written, but also by the senior nurses who teach her, and by those medical officers in psychiatric wards who desire to be able to train and supervise their nursing staff.

DISEASES OF THE NOSE, THROAT AND EAR.

I. SIMSON HALL's compact little book "Diseases of the Nose, Throat and Ear" has since 1937 met the needs of students and practitioners for whom it is intended as a not too cumbersome textbook for undergraduate study and as a speedy reference work for the busy general practitioner. In spite of great difficulties during the recent hostilities the author managed to produce a third edition in 1944.²

The same high standard of publication as in previous editions has been maintained. The textbook has been slightly rearranged to facilitate reference, and some further highly useful illustrations have been added.

A description is given of some of the commoner ear, nose and throat operations. The technique for gullotine tonsillectomy described by the author would not appeal to many operators who prefer to employ this instrument after the technique of Sluder and Phylbus. In this method the instrument itself is used to lift the tonsil out of its bed in the so-called "reversal" process, and then to sever the stretched attachments by the crushing motion of the blade rather than the process of finger dissection, as described by Hall, who uses the gullotine as little more than a holding instrument. The description of tonsil dissection, while clear to a trained reader, is inadequate for the inexperienced and detracts from the usefulness of the book in these days when almost every graduate is inclined to consider tonsillectomy

as within his scope. *Paracentesis tympani* is more adequately described so that the beginner, obliged to perform this procedure himself, should be able to do so with confidence.

A series of excellent drawings show the progressive degrees of surgical endeavour first in the Schwartz, then in the modified radical, and finally in the complete radical mastoido-tympanectomy, a sufficient description to guide the student and assisting practitioner.

Proof puncture of the maxillary antrum is described in an instructive manner and is clarified with an excellent illustration.

Difficult as it is to include everything in a small text dealing with a specialized subject, the author has striven well to meet the needs of most, and with each succeeding edition there has been evidence of well thought out efforts to improve on the earlier productions where necessary.

OPERATIVE SURGERY.

THE second edition of "Synopsis of Operative Surgery", by H. E. Mobley, is now to hand.¹ It is just another of the books on the same subject from which the student has to pick one which will be his guide in his studies during his clinical years, and for a very clear description of the subject he need look no further than this book. Perhaps one of the most pleasing features of the publication is the excellence of the illustrations, all of which are hand-drawn, and some are also in colour. These drawings do much to enhance an already clear text, which in itself is readily readable. One chapter which could have been greatly enlarged is the one on anaesthesia, for it is far too brief and its ten pages are not nearly enough upon so important a subject. The chapters on general surgical technique and post-operative care are likewise rather brief; but as the book is termed a synopsis, too much detail cannot be expected. However, it is a pity to see these important topics given only brief mention.

THE GLANDS OF DESTINY.

THE third edition of the book "The Glands of Destiny",³ by Ivo Geikie-Cobb, presents the problems of the various glands of the human body in a readily readable fashion, and in a manner that makes the book interesting to laymen just as much as to medical men. The book is divided into two parts. The first is confined to chapters on the various glands and their secretions, and the second part presents short sketches of prominent historical characters, with the author's ideas as to the parts played by their glands in the shaping not only of their own destiny but even the destiny of the world. The reasons why Henry VIII had six wives are entertainingly discussed, as also are the reasons why Henry's daughter Elizabeth remained a spinster.

The normal physiological actions of the various glandular secretions are described, and while full mention is made of their pathological roles, the book cannot be regarded as a textbook on the subject. It is, however, a book that presents the subject in a concise fashion and at the same time it is both instructive and entertaining.

CHILD HEALTH.

A FURTHER book in the series published as "The Practitioner Handbooks" now appears with the title "Child Health"; it is edited by Alan Moncrieff and William A. R. Thomson.⁴ The book does not deal with the diagnosis and treatment of the diseases of childhood; rather is it concerned mainly with the problems arising from the various handicaps and stigmata that afflict children, and each special subject is

¹ "Synopsis of Operative Surgery", by H. E. Mobley, M.D., F.A.C.S.; Second Edition: 1947. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 7½" x 5", pp. 416, with many illustrations, some of them coloured. Price: 45s.

² "The Glands of Destiny: A Study of the Personality", by Ivo Geikie-Cobb, M.D.; Third Edition: 1947. London: William Heinemann (Medical Books), Limited. 8½" x 5½", pp. 270, with many illustrations. Price: 15s.

³ "Child Health", edited by Alan Moncrieff, M.D., F.R.C.P., and William A. R. Thomson, M.D.; The Practitioner Handbooks; 1947. London: Eyre and Spottiswoode (Publishers), Limited. 8½" x 5½", pp. 254. Price: 14s.

¹ "The Practice of Mental Nursing", by May Houlliston, R.G.N., R.M.N., R.F.N., with a foreword by P. K. McCowan, J.P., M.D. (Edinburgh), F.R.C.P. (London), D.P.M.; 1947. Edinburgh: E. and S. Livingstone, Limited. 7½" x 4½", pp. 176. Price: 7s. 6d.

² "Diseases of the Nose, Throat and Ear: A Handbook for Students and Practitioners", by I. Simson Hall, M.B., Ch.B., F.R.C.P.E., F.R.C.S.E.; Third Edition: 1944. Edinburgh: E. and S. Livingstone. 7" x 5", pp. 470, with illustrations, some in colour. Price: 16s. net.

written by an acknowledged expert in that line. An excellent chapter is devoted to the subject of the organization of child welfare centres, or as we here would call them, baby health centres, and included is the author's illustrated suggestion of an ideal plan for such a centre. All the many aspects of the dietetic problems of childhood from the natural feeding of babies to the feeding of growing school children are discussed.

The care of the deaf child, the blind child, the crippled and the congenital syphilitic are all elucidated and the vexed question of the education of such children is tackled in a very practical manner. The problem of the mentally deficient is also considered. This book will be useful not only to general practitioners for whom it was primarily written, but also for all school medical officers, public health officers and almoners.

PÆDIATRICS FOR NURSES.

THIS fourth edition of "A Textbook on the Nursing and Diseases of Sick Children", edited by Alan Moncrieff, will be welcomed for its usefulness to the nurse and those medical practitioners who have to supervise the training of the nurse in the care of sick children.¹ The third edition of 1941 has been reprinted twice in the years between its publication and that of the fourth edition. It is obvious that the book has proved its usefulness.

The revision of the new edition was begun before the end of the war, and in spite of the difficulties that had to be faced, has been carried out successfully. The book has been brought up to date by the addition of many new details in nursing procedures. The chapter on the care of the normal child should be useful, as the basis of the nurse's training in the care of the sick child should be a knowledge of the management of the child who is well. There is also a valuable summary of the psychological aspect of the disorders in childhood by Professor D. R. MacCalman.

There have been some changes in authorship in several of the sections.

The excellent illustrations have been increased in number and new photographs mostly taken at the Hospital for Sick Children give an added value to the text. This is a worthy successor to the previous editions.

A YEAR BOOK OF PHYSICAL MEDICINE.

In his introduction to "The 1946 Year Book of Physical Medicine", the editor, Richard Kovács, has outlined briefly the advances and changes that occurred during the preceding year in the world of physical medicine.¹ Of considerable interest is the fact that the Council of Physical Medicine of the American Medical Association has endorsed the term "physiatrist" to denote a specialist in physical medicine. There appear to be no etymological objections to the word, and perhaps its acceptance in the United States will be followed by its acceptance elsewhere. Kovács is apparently prepared to assume that it will be accepted as he does not hesitate to refer, again in the introduction, to articles by "leading British physiatrists" which had appeared in a special British issue of the *Archives of Physical Medicine* during the year. Speaking generally, Kovács states that physical medicine in America made considerable advances during 1946 in its general status as well as in research, education and increase in the numbers of those practising the speciality. The clinical practice of the speciality has profited both in quality and extent from wartime activity. He states that "wartime conditions slowed research in most of the physical therapy centers abroad", but that evidence of renewed activity has been coming to hand, as shown by a number of reports from abroad appearing in the volume. There is, in fact, quite an appreciable contribution from Britain in this year book, but the bulk of the literature included is from North America.

The material summarized is grouped into two parts—the first part having to do with physical therapeutic methods and the second with applied physical therapy. The size

¹"A Textbook on the Nursing and Diseases of Sick Children for Nurses", by various authors, edited by Alan Moncrieff, M.D., F.R.C.P.; Fourth Edition; 1947. London: H. K. Lewis and Company, Limited. 8½" x 5½", pp. 758, with many illustrations. Price: 30s.

²"The 1946 Year Book of Physical Medicine", edited by Richard Kovács, M.D.; 1947. Chicago: The Year Book Publishers, Incorporated. 7" x 5", pp. 400, with illustrations. Price: \$5.75.

of the first part of the book and the wide variety of ideas brought forward are sufficient indication of the expansion of the speciality. Stress is laid in several papers reviewed on the importance of a knowledge of physical therapy to the general practitioner and of the essential simplicity of many of the most effective methods of physical therapy; but it is difficult not to be awed by the applied physics and elaborate apparatus discussed by many of the authors. After a preliminary section on "general considerations", sections follow on thermotherapy (hyperthermy and hypothermy), electrotherapy (with its relation to the investigation of nerve function as well as the diagnosis and treatment of nerve lesions), light therapy, hydrotherapy, spa therapy, mechanotherapy (exercise, rest, posture, manipulation and massage with separate subsections on artificial respiration and on prosthetic devices), occupational therapy, institutional work, convalescence and rehabilitation (an extensive section mostly covering post-war experiences), physical fitness, and industrial medicine.

In the second part of the book the application is considered of physical therapy to various disease entities and to broad groups of conditions. One finds papers not only on the more obvious role of physical therapy in relation to traumatic, orthopedic and rheumatoid conditions and to paralysis and other neurological states, but also on its place in both the conservative and surgical treatment of chest conditions, and discussions of a variety of forms of physical therapy applicable to disorders of all the systems.

Much of the subject matter of this book will be of value only to those who take a special interest in physical medicine, but its perusal would be helpful to most practitioners and illuminating to those who tend still to think of physical therapy in terms of massage and pretty coloured lights. The production and printing of the volume maintain the usual high standard of the series.

DISEASES OF CHILDREN.

It is good to see new editions of the British paediatric textbooks becoming available. We recently reviewed Wilfred Sheldon's "Diseases of Infancy and Childhood", the best of the small textbooks on this subject. Garrod, Batten and Thursfield's "Diseases of Children" is about twice the size and of the same excellent quality.¹ For the practitioner who wants a little wider scope and greater detail than that provided by the smaller book, we can strongly recommend it.

As yet only the first volume is available. The initial section entitled "General Considerations" is perhaps the most useful in the book. Denis Browne's refreshing outline of the principles of the surgical management of congenital deformities, with its emphasis on function as an aid to corrected development and outspoken condemnation of some of the older methods that thought of position only, leaves one wishing for more. The chapter on the use of drugs in infancy and childhood contains an excellent discussion of the sulphonamides and penicillin. The value and limitations of some pathological examinations and some practical points on the collection of specimens make the section on clinical pathology a useful link between bedside and laboratory. A detailed discussion of the important subject of water balance and acid-base regulation is included. Of great use is the discussion of practical procedures, including the giving of blood transfusions and fluids by various routes to infants. Donald Paterson's discussion on infant feeding deals thoroughly with food compositions and values and uses, but pays too little attention to difficulties in technique of feeding. The science of infant feeding is adequately discussed, but the art is overlooked.

The same general tone of practical usefulness is found in the systematic discussion of the diseases of children that follows and occupies the major part of the book. For the most part we can commend it without question. Occasionally, as in the discussion of asthma, we must disagree. George Bray's discussion of the allergic factor in asthma is thorough, but it is a pity there is such emphasis on allergy with but a passing mention of the perhaps more important emotional and infective factors that irritate the child with the asthmatic diathesis. However, an occasional disagreement is inevitable and simply adds interest to an excellent book.

Volume I is now available, and Volume II is at present in active production and will be completed early next year, but each volume will be able to be bought separately.

¹"Diseases of Children" (Garrod, Batten and Thursfield's), edited by Donald Paterson, M.D. (Edinburgh), F.R.C.P., and Alan Moncrieff, M.D. (London), F.R.C.P.; Volume I; Fourth Edition; 1947. London: Edward Arnold and Company. 9" x 6", pp. 784, with many illustrations. Price: 30s.

The Medical Journal of Australia

SATURDAY, SEPTEMBER 20, 1947.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE NUFFIELD FOUNDATION.

The objects of the Nuffield Foundation in Great Britain are three in number: first, the advancement of health and the prevention and relief of sickness, in particular by medical research and teaching and by the organization and development of medical and health services; secondly, the advancement of social well-being, in particular by scientific research and by the organization, development and improvement of technical and commercial education, including the training of teachers and provision of scholarships and prizes; thirdly, the care and comfort of the aged poor. The resources of the foundation consist of the Nuffield Fund, which is a capital fund of £10,000,000, provided by Lord Nuffield, and the Auxiliary Fund, for which the trustees may accept gifts and bequests from other persons wishing to advance the objects of the foundation. This foundation, which from its nature is bound to claim the attention of all who have to do with medical research, preventive medicine and social science, has an added interest for the members of the medical profession of Australia, because by the end of March, 1947, fifteen of its members had been awarded by the foundation Dominion Medical Travelling Fellowships. In the first report of the trustees, issued in 1946, it was explained that the trustees intended to work in five-year periods and to plan for each period a programme of major and related policies. The programme which began on April 1, 1944, dealt with the medical, natural and social sciences, fellowships and similar awards, and the care of the aged poor. The second report has now been published and we propose to draw attention to some of its more important features. We read that in its earlier years the foundation found its most promising opportunities in the medical and physical sciences, but that during the year under review its chief concern has been with the social sciences and the provision for the care and comfort of old people. In addition to this the schemes for Commonwealth and Empire Fellowships and Scholarships "have taken more definite shape". Before any details of these activities are set out, one aspect of finance should be mentioned. We are told

that in Great Britain today, from the proceeds of taxation, very large sums are spent by the Government on social services and increasing amounts on research and other cultural pursuits. This growth of State expenditure "does not lessen the need for substantial private and voluntarily provided funds which can be devoted more especially to the new, the hopeful but unproven venture". Official help and support are all very well, but in a democratic society "it is a necessity and not a luxury that alternative sources of assistance should exist". With this statement most of us will agree. It is undoubtedly true, as the trustees remark, that even the wisest and most knowledgeable authorities may err in their judgement of the possibilities of new ideas; it is therefore to the public good that in matters of this kind there should be room for more than one opinion and for more than one means of putting that opinion to the test. The trustees make use of a quotation whose origin is not stated: "Every reform was once a private opinion, and when it shall be a private opinion again it will solve the problem of the age." It would be to the public good if those in control of governments could be made to appreciate this. That taxation always takes its toll is clear from the statement by the trustees of the interest and dividends on the trust's investments for the year ended March 31, 1947. The net amount of dividends and interest was £210,416 13s. 6d.; the income tax deducted was £172,159 1s. 10d., an amount in excess of the sum which before the recent war the Government paid as a grant-in-aid every year to the Medical Research Council of the Privy Council. From the point of view of pounds, shillings and pence alone, therefore, the Nuffield Foundation may be said not only to carry out its own programme, but to supply the Government with the means to finance the Medical Research Council of the Privy Council.

The foundation's provision of fellowships, scholarships and other awards now covers a wide field. It may be noted in passing that the foundation has taken under its protective wing Australian scholars sent to England by the Central Council of the Australian Red Cross Society and also the Gordon Craig scholars of the Royal Australasian College of Surgeons who have gone to England. In an appendix to the report are set out the names, qualifications and so on of fifteen Australians who hold Dominion Medical Travelling Fellowships. The Australian fellowships may be held for one year only—this was the recommendation of an Australian committee. Canada has nine fellowships; five are for one year only and four may be extended to two years. India has four fellowships, each for two years. New Zealand has three fellowships, each for two years. Reference is made to the high quality of the scholars who have come from the Dominions and from India. The most encouraging statement about these fellowships, however, is that though the scheme was intended originally to extend over a period of only two years, it is hoped that it will be placed on a permanent basis. The foundation as a matter of fact is seeking opportunities for similar schemes, applicable to students in other branches of knowledge and spheres of activity. Grants have been made for fellowships in metallurgy and farming in England and for travelling fellowships for Southern Rhodesian farmers. A grant has been made to the University of Manchester for the establishment of a research unit in chronic rheumatism.

The committee, which under the chairmanship of Mr. Seeborn Rowntree made a survey of the problems of aging and the care of the old people in Great Britain, acted under the ægis of the Nuffield Foundation. The report of this, the Rowntree Committee, is described as one of the landmarks in the history of society's attitude to the care of old people. A unique tribute was paid to this non-official report by official notice taken of it by the Government. It is pointed out that many of its recommendations will require legislative action. One of these has to do with the statutory inspection of voluntary homes for the aged—a measure which has been urged repeatedly in this journal as necessary for Australia. The Nuffield Foundation trustees state that it is reasonable to hope that some at least of the recommendations will be implemented. One important consideration in this foundation's programme may be emphasized. It is that since old people are a cross-section of the population who are having to cope in varying degrees with the difficulties occasioned by declining powers, no single type of accommodation is the answer to all needs. (This has also been emphasized in these pages.) This subject need not be pursued at length, but it may be stated that mental equipment and habit are among the chief factors to be considered in efforts to secure peaceful and pleasant conditions for the aged. The aged should not be expected to live alone and unenlivened by any contact with youth—the habit of pushing an aged relative into a so-called rest home and leaving him or her (it is more often a female relative) there to vegetate is all too common. In this report we read that provision for old people "must, in the interests of both young and old, be so planned that it is integrated into the life of younger sections of the community so as not only to enliven the surroundings of the older generations, but also to enable the young to contribute in awareness and in activity to the welfare of the old". The range of the provision to be made should, it is held, include: (a) residential accommodation (small houses, bungalows, flats, residential clubs, with communal feeding and recreational facilities) for able-bodied old people; (b) a communal home or homes where the infirm or long-term sick not requiring active hospital treatment can be given the care and attention that they need; (c) provision for the treatment of short-term sickness and for the convalescence of old people who have had treatment in hospital; (d) accommodation for short-stay residents normally living with relatives; (e) a club providing meals, recreational and occupational facilities, and a simple health centre for old people living in the area. The trustees of the Nuffield Foundation write hopefully about the inauguration of a National Corporation for the Care of Old People. Its hopes have been realized, for this national body, which is the logical outcome of the Rowntree Report, was inaugurated on July 28, 1945, at Mansion House, London. Sir William Goodenough in a signed article in *The Times* of July 28, 1947, states that the purpose of the corporation will be, not to supersede, but to support, all existing worth-while efforts for the welfare of old people; its efforts will be complementary to those of the National Old People's Welfare Committee. The corporation, which begins its work with an initial grant of £500,000 from the Lord Mayor of London's Fund, is regarded by Sir William Goodenough "as a means . . . of ensuring that the work of local voluntary organizations,

working alongside and often in cooperation with public authorities, is . . . 'on a large enough scale, is properly coordinated, and is not hampered by lack of funds'".

A good deal of space has been given to a description of the Nuffield Foundation's efforts in the care of the aged poor. This has been done, not only because the work is of great interest, but as pointing in the direction of work that needs to be done in this country. The report that has been discussed contains reference to other activities of the Nuffield Foundation, such as the establishment of an experimental reception centre for homeless and insecure children and the setting up of a board for the correlation of medical science and physical education, but these must be dealt with on some future occasion.

Current Comment.

PRESCRIPTION WRITING.

FROM time to time much discussion has taken place on the relative merits of Latin and English for the writing of prescriptions and of the imperial and metric systems for the statement of dosage. Strong arguments have been brought forward by the advocates of each. Meantime the bulk of the medical profession (in this country, at least) uses a comfortable mixture of all four, according to taste and fancy. The customary superscription is the mystic symbol R which, according to a well-known textbook, "originally was used, it is supposed, to represent the symbol of the planet Jupiter, at a time when much of the virtue of a combination appeared to rest upon the deity or presiding star". It is now usually regarded as representing the imperative mood of the Latin verb *recipio*, to take—an admirable way of making the old superstitious symbol respectable. Many people are, of course, anxious that prescriptions should be not merely respectable, but rational and scientific in the modern sense; their arguments are convincing enough, but their success has been quite limited. No attempt has been made in this country, as far as is known, to obtain the general opinion of either academic or practising members of the medical profession on the matter, but interesting information has recently come to light from Canada. Russell A. Wand¹ has recorded the results of inquiries made of representative bodies and individuals throughout Canada regarding the language and the system of weights and measures favoured for prescription writing.

On the relative merits of Latin and English opinion was divided. The attitude of the Provincial licensing boards was felt to be of particular importance, but no unanimity was found. One felt that the matter should be entirely optional and that most practitioners would favour English; another said that the writing of prescriptions was always badly performed and did not warrant the study of a dead language that was "of no other service". The registrar of another Province regretted, but tended to accept, the decline of the classics, but suggested as a compromise the retention of the convenient Latin abbreviations used in the directions; another preferred to retain Latin until a modern international language was adopted; yet another pleaded for the value of tradition and liberal education as against modern commercialism and factual education. Others said that the question was one for the Provincial or Dominion medical associations. The latter, however, felt either that it was a matter for the universities or that a change from Latin was not opportune. The pharmacists were keenly interested, particularly those engaged in teaching. Latin was felt to be important in the maritime areas, not only because of the older physicians who preferred it, but because of prescriptions coming from overseas where Latin was still in use; a similar preference for Latin was expressed in the French-speaking

¹ *The Canadian Medical Association Journal*, June, 1947.

area. One experienced teacher of pharmacy favoured Latin because it was universally understood (among doctors and pharmacists), because of the useful Latin abbreviations, and because he thought it better that the layman should not know what drugs were prescribed for him. Another experienced teacher expressed unqualified preference for English. A representative of a retail druggists' association pointed out that there was not much room for Latin in the widespread modern practice of prescribing proprietary preparations. The Canadian Conference of Pharmaceutical Faculties, which met in August, 1946, by a small majority, favoured the retention of Latin. The medical schools were far from being agreed. At Dalhousie Latin was felt to be out of date. At McGill University prescription writing in English is taught, but a student may write in Latin if he wishes; it is insisted, however, that the prescription must be written entirely in the language chosen. At Queen's University it is left to the students; 90% or more use English. At the University of Toronto the students are allowed to write prescriptions either in Latin or in English, but they must know Latin names as indexed in textbooks and for international use. At the University of Western Ontario it is insisted that students learn to write prescriptions in Latin; they are allowed to change to English if they so desire, but only during the later part of the course in pharmacology. At the University of Manitoba, Latin in full or abbreviated is insisted upon; English is used for specific or unusual details in the directions. The decline of Latin has been accepted regretfully at Alberta University; English is favoured in the directions and other parts of the prescription, but not necessarily for the names of various ingredients. The factor which apparently has influenced most of the teaching authorities is the increasing number of students who have learnt no Latin at school and the growing tendency to exclude Latin from matriculation requirements. While the schools which insist on Latin claim that sufficient of the language for prescriptions is easily enough acquired, other schools feel that it is an unnecessary strain to impose the use of Latin on those with no previous knowledge of it and that bad Latin is not desirable. The strongest argument appeared to be its international value. The only opinion from the student viewpoint came from delegates to the annual meeting of the Canadian Association of Medical Students and Interns; four voted against the teaching of prescription writing in Latin and seven in favour.

Opinion among the same bodies and individuals regarding the adoption of the metric system was essentially favourable in all cases, though there was disagreement regarding its immediate practicability, and some felt that it should remain optional. It was noted that the metric dosage of many of the newer drugs had been universally accepted, but that the busy practitioner showed less readiness to transpose doses of the older drugs learnt and long used in the imperial system.

It seems reasonable to suggest that opinion in Australia would correspond fairly closely with the Canadian viewpoint. Apart from tradition there is little argument to be found against the adoption of the metric system, though it would probably take a generation to bring it into practical use. It has the approval of the British Pharmacopoeia and its virtues were well put forward in an article by H. Finemore, published in this journal on December 15, 1945. As to Latin, it will be generally conceded that English is easier for practical purposes and that very few practitioners could write a prescription in grammatical unabbreviated Latin, if they wished. Yet the Latin drug names (with their case endings conveniently chopped off) have become a matter of habit and the abbreviated Latin terms covering standard directions are convenient and probably less ambiguous than abbreviated English would be. Finally many will feel, even though their detailed knowledge of Latin is lost in the shadowy past, that they are richer in thought and in the appreciation of their own language by having known something of this so-called "dead language"; they have at least tasted at one of those "native Mediterranean springs" from which Sir Arthur Quiller-

Couch asserts that English literature has always drawn its strength and purity. One cannot accept without protest the tendency to discard from the training of the medical practitioner—or of the follower of any branch of science—anything whose value is not "practical" but "merely cultural or literary". The narrower such training becomes the more true will be such statements as that of Sir James Barrie: "The man of science appears to be the only man who has something to say, just now—and the only man who does not know how to say it." Factual education is not enough.

But we must return, in conclusion, to our text. Prescription writing is essentially a personal matter and each practitioner will have his own way, even despite formularies and the like. He will slowly, but quite surely, adopt what is practically sound and what goes for clarity in essentials; but he will not be readily weaned (and who should gainsay it?) from the quaint symbol and the mysterious phrase which are really quite clear to all who need to understand. He will certainly not easily abandon his beloved invocation of Jove.

THE CARE OF PREMATURE INFANTS AT HOME.

THE outlook for premature infants is improving continually as various agencies combine to establish more firmly their rather precarious initial foothold on life. It is of interest to read an account by F. J. W. Miller of the plan adopted at Newcastle-upon-Tyne, in England, for the care of premature infants who are born at home.¹ Miller does not advocate that premature infants should be born at home, but states that if they are born there they should not necessarily be removed to hospital; the results of the home care plan in Newcastle-upon-Tyne "will bear comparison with those obtained in premature infant units".

Newcastle-upon-Tyne is an industrial city with generally poor housing conditions. Most infants are born at home, domiciliary midwifery being conducted largely by the midwives of the municipal service and the district service of the voluntary hospital. Each year 250 to 300 premature infants are born, 80 to 100 of these at home. The plan adopted provides equipment and skilled assistance in the care of these premature infants born at home. The sets of equipment, which include a draught-proof cot with accessories, hot water bottles, feeders, thermometers *et cetera*, are available on loan when requested. One midwife of the municipal service who has received special training is engaged whole-time on the work, and another works half-time. All midwives have received instruction in the care of premature infants. Domestic help is supplied if necessary. A medical practitioner or midwife faced with the care of a premature infant makes the necessary request and the "premature nurse", with equipment as required, takes over the responsibility. Occasionally she stays in the house all night or all day, but mostly relies on regular visits. Four weeks is the usual period of supervision. A district health visitor then takes over. The "premature nurse" also teaches pupil midwives and one usually accompanies her on her visits. The role of a "premature nurse", Miller states, is friend, helper and teacher; the points upon which she concentrates are feeding, warmth, standards of cleanliness and the avoidance of infection. No special charge for the extra service is made. The scheme has been in operation for only seventeen months and is, as yet, limited in its scope, but the results quoted appear to be satisfactory. The personal qualities of the midwife chosen for the task have apparently been an important factor in success, but the practicability of the scheme seems to have been demonstrated and the burden on hospital accommodation relieved. Miller concludes with the remark that ultimately the best results will be obtained when premature births can be avoided or planned to take place under the best conditions. Meantime Newcastle-upon-Tyne has coped with the existing situation in a practical manner.

¹ Archives of Disease in Childhood, March, 1947.

Abstracts from Medical Literature.

RADIOLOGY.

Pulmonary Complications of Dorsal Sympathectomy.

ROBERT C. PENDERGRASS AND FRANK F. ALLBRITTEN, JUNIOR (*American Journal of Roentgenology*, February, 1947), state that post-operative X-ray examination should be a routine measure following dorsal sympathectomy. This procedure serves to detect any complications and to demonstrate whether the correct rib was resected. Patients with sizeable collections of blood in the extrapleural space may not exhibit any significant symptoms soon after operation. If X-ray examination is not made, the optimum time for aspiration of this blood may elapse. Postero-anterior and lateral views should be made routinely. Radiographs made with the Potter-Bucky diaphragm or with a stationary grid will often yield information not available on those made with the usual chest technique. This is particularly true if the effusion is confined to the upper portion of the thorax. Differentiation of the extrapleural accumulation of fluid from effusion in the intrapleural space may at times be difficult, but the following points should be helpful in this differentiation: (i) with the patient in the erect position, extrapleural fluid does not collect in the costo-phrenic angle; (ii) with the patient in the supine position, extrapleural fluid does not disperse as a diffuse shadow, but retains the same contour as in the erect position; and (iii) a convex lower and anterior border is seen with the larger fluid collections. This resembles the shadow seen with encysted empyema, but is usually confined to the upper posterior part of the thorax. The clinical findings consistent with a large empyema collection are usually absent and aspiration reveals the presence of blood.

Carcinoma Simulating Pulmonary Tuberculosis.

LOUIS E. SILTZBACH (*American Review of Tuberculosis*, February, 1947) states that it must be recognized that circumscribed bronchial carcinoma may be silent for a long period and in this respect behaves like some cases of early pulmonary tuberculosis. Two such cases are described in which the patients were treated for pulmonary tuberculosis seven and sixteen months respectively before the nature of the lesion was recognized. In both these cases the initial lesions measured about 2-0 centimetres and had a veil-like, somewhat amorphous appearance, but on close inspection it could be seen that the mesial borders were rounded, whereas the lateral borders faded out and were streaky. These streaked shadows probably represented small foci of atelectasis arising either from obliteration of small bronchial lumina by the neoplasm or some pressure exerted upon the lumen by the expanding extramural mass. Some of the veiled shadow may also have represented atelectatic lung tissue. Later the shadow became denser and more sharply demarcated from the surrounding lung parenchyma, and it then represented the neoplasm itself. Central necrosis of the neoplasm may occur.

Should this be visible within the mass on the initial film and should the sputum be persistently free of tubercle bacilli, such a lesion must be presumed to be neoplastic and exploratory operation warranted. The combination of an increase in density and the concentric expansion of a circular or oval nodule should lead one away from a diagnosis of pulmonary tuberculosis. On the other hand the presence of multiple areas of calcification within the shadow—sometimes only demonstrable with sectional radiography—favours the diagnosis of an ancient tuberculous focus. If there are other tuberculous lesions within the lung fields, this diagnosis is considerably reinforced. Although a fresh tuberculous infiltration may sometimes assume a circular or oval contour, its spread is not likely to be concentric, but rather takes the form of acino-nodular or bronchopneumonic lesions in the neighbouring or distant segments of the lung. In the course of healing without spread, such round or oval foci grow smaller as their density increases. Circumscribed neoplasms sometimes exhibit necrosis which may progress to gross cavitation. In general the walls of such cavities are thicker and more likely to show irregular scalloping of the inner margin than do tuberculous cavities. The presence or absence of tubercle bacilli in the sputum or in the gastric contents is an all-important diagnostic criterion in such instances. Other diagnostic measures unfortunately are seldom helpful. A negative response to the tuberculin test is not too common in patients over forty, particularly in urban areas. Even when a negative response occurs, it does not completely exclude tuberculosis. Nor can much information be gained from bronchoscopic examination, since the location of the lesion most often places it beyond the view of the bronchoscopist.

Radiological Features of Mucocele of the Appendix.

EDWIN J. EUPHRAT (*Radiology*, February, 1947) draws attention to the importance of considering the possibility of mucocele of the appendix when clinical and radiological findings point to the right lower quadrant of the abdomen. He states that a sharply circumscribed globular or kidney shaped mass, mobile but not separable from the caecum, with displacement of the latter in a medial direction, can hardly be attributed to anything other than mucocele. Additional findings such as failure of the appendix to fill with a contrast agent, calcification, and a vorticeous appearance of the caecal mucosal pattern simply add further support to the diagnosis. A pyogenic abscess of the appendix or per-appendicular tissues is a firmly fixed mass. An ovarian cyst not only is unlikely to become adherent to the caecum, but, if it does, will displace it laterally rather than medially. A retroperitoneal tumour should be fairly immobile. An intrinsic tumour of the caecum does not displace it. Calculi of urinary origin are identified by urological methods.

Radiological Findings in Myasthenia Gravis Associated with Thymic Tumours.

C. ALLEN GOOD (*American Journal of Roentgenology*, March, 1947) reports that in 17 of a series of 100 consecutive cases of *myasthenia gravis* radiological

examination disclosed a tumour in the anterior part of the mediastinum. Exploratory operation was performed in eleven cases and necropsy was performed in three other cases. In all but one case, microscopic examination demonstrated that the tumour originated in the thymus gland. No single type of radiological examination was responsible for the diagnosis. It was necessary to use fluoroscopy and lateral X-ray photographs as well as the more routine postero-anterior projection. Thymic tumours found in this series have been grouped into two classes according to the ease of radiological recognition. One type is well defined and easily seen in all X-ray photographs. The other type is plaque-like in shape and is easily overlooked. The recommended radiological procedure in all cases of *myasthenia gravis* consists of fluoroscopy and the taking of lateral X-ray photographs of the thorax as well as the more customary stereoscopic X-ray photographs made in the frontal projection.

PHYSICAL THERAPY.

Lymphoblastoma.

WILLIAM PALAZZO (*Radiology*, May, 1947) has set out to evaluate the difference in radiosensitivity of the various types of lymphoblastoma and to make a plan for differentiating between the types when a mass presents itself in the mediastinum or abdomen and no lymph gland is available for biopsy. The lymphoblastomata are classified as follows: (i) giant follicular lymphadenopathy, (ii) lymphatic leukaemia, (iii) lymphosarcoma, (iv) polymorphous-cell sarcoma, (v) Hodgkin's disease. Giant follicular lymphadenopathy is not essentially a malignant lymphoblastoma, but is included because approximately 20% of the cases proceed to leukaemia or Hodgkin's disease or polymorphous-cell sarcoma. It is very radiosensitive. Lymphatic leukaemia is diagnosed from the other lymphoblastomata by the demonstration of abnormal cells in the blood stream. Even in the so-called aleukemic leukaemia repeated examination of the blood will eventually establish the diagnosis. Three types of lymphosarcoma are recognized: small cell, large cell and reticulum cell lymphosarcoma. These are all radiosensitive; with one or two doses totalling 200r to 600r (in air) delivered at 200 kilovolts, through a copper filter of 0.5 millimetre thickness and an aluminium filter of 1.0 millimetre thickness, a mediastinal mass large enough to cause pressure symptoms will diminish in size as much as 50% in three or four days. Polymorphous-cell sarcoma was first discussed in 1938 by Symmers, who showed the capacity of giant follicular lymphadenopathy to undergo direct transformation to this disease. The condition is relatively radioresistant, requiring doses of 1300r to 2500r (measured in air) to cause appreciable regression in size. Hodgkin's disease is characterized by generalized involvement of the lymphoid and reticulo-endothelial system, including the spleen, by a characteristic pathological process. Most observers consider that Hodgkin's disease, of all the lymphoblastomata, is the most resistant to treatment by radiation. The author describes a therapeutic test for a mediastinal mass. Firstly a pre-radiation X-ray film

is obtained and measurement taken of the size of the mass. On the first day a dose of 300r (measured in air) is directed towards the tumour (with a current of 200 kilovolts). On the second day a further dose of 300r is administered. On the fifth day a further X-ray film is examined and measurement taken of the mass. If the mass has decreased appreciably in size (25% or more), a presumptive diagnosis of lymphosarcoma or giant follicular lymphadenopathy is made. If the tumour shows little or no regression, the dosage of 200r a day is continued, an X-ray film being taken every three days. If the mass shows regression when a dose of from 1200r to 2000r has been given, a presumptive diagnosis of polymorphous-cell sarcoma is made. If a dosage as great as 2000r to 3000r is required to cause a reduction of 25% to 50% in the size of the mass, a diagnosis of Hodgkin's disease is made. If there is no response with a dosage of 3000r the tumour is not radio-sensitive and is probably not a lymphoblastoma, but may be fibrosarcoma, bronchiogenic carcinoma, carcinoma of the thyroid *et cetera*. The dosage given refers to the skin dose, not the tumour dose.

Boeck's Sarcoid (Sarcoidosis).

ABRAHAM OPPENHEIM (*American Journal of Radiology*, January, 1947) states that Boeck's sarcoid is a generalized systemic disease of protean manifestations, characterized by chronic duration, variable clinical picture and a usually benign course. In its tendency to affect many organs it simulates the lymphomatous diseases. A definite diagnosis can be established by biopsy, but as peripheral lymph nodes are not constantly present, biopsy is not always possible. A distinct help in diagnosis of the pulmonary type is the discrepancy between the massive anatomical involvement and the paucity of respiratory symptoms and signs. There is a definite tendency towards healing in the case of the chest lesions, but the time varies and may be long; recent authors have mentioned the lack of specific treatment, but many others consider irradiation therapy of great value. The author has a series of 42 cases. Irradiation therapy was given to all patients who showed symptoms, and the patients were followed up far as long as possible. Two patients died—one following an operation for carcinoma of the thyroid gland, the other six years after diagnosis from a condition resembling massive tuberculous involvement. Bone changes were seen in only one patient. For treatment the author used small doses of X rays only, whether to peripheral nodes or mediastinum, although if the affected tissue can be removed *in toto* by surgical treatment that is preferred, for example, in the case of sarcoidosis of the stomach. Twenty patients have been treated and observed over a sufficient period of time for judgement to be possible of the effects of irradiation. Three showed no improvement in X-ray appearances and no change in clinical symptoms. The method used was the application of a dose of 100r (in air) to the anterior and posterior mediastinum daily for six doses to each field (a current of 250 kilovolts and a copper filter 1.5 millimetres in thickness were employed). Peripheral nodes received a dose of 100r to 400r in one treatment. Two months' observation then followed, and

if necessary the dose was repeated. The author concludes that the course of the disease is favourable; complete regression of mediastinal and pulmonary involvement has followed irradiation, and, while spontaneous recovery can take place, treatment by irradiation makes a favourable prognosis more likely.

Cancer of the Breast.

I. I. KAPLAN AND R. ROSH (*Radiology*, December, 1946) have made a study of patients treated over a period of twenty years in the radiation therapy department at Bellevue Hospital, New York City. The development of the newgrowth had reached stage I in 181 patients, stage II in 452 patients, stage III in 203 patients and stages IV and V in 193 patients. Pre-operative X-ray therapy is advocated with operation within three weeks of the treatment. The authors consider, too, that post-operative irradiation should be given in addition as soon as the wound is healed, and that this is essential if no pre-operative treatment has been given. The statement often made that irradiation is responsible for the swelling of the arm following radical mastectomy is denied. The authors assert that this is due to scarring and secondary infection following operation. Ovarian sterilization has aided in the control of breast cancer and it is the authors' practice to sterilize young women with this condition if permission is given. This procedure is also of value in older women with skeletal metastases. The question of the administration of estrogenic or androgenic hormones is discussed. Hormone therapy must be given with care; estrogens in particular may stimulate a metastatic focus into activity. Most clinicians who have observed large numbers of patients treated by hormone therapy consider that it is of little value in carcinoma of the breast and may be dangerous if given indiscriminately. The conclusions reached were as follows. (i) Irradiation is a valuable adjunct to surgery in the treatment of carcinoma of the breast. The best results are obtained, following early diagnosis, with pre-operative irradiation, surgery and post-operative irradiation. (ii) For favourable results surgery should follow within three weeks of irradiation. (iii) X-ray therapy administered within any period following surgery is of definite value in alleviating distress and prolonging life. (iv) Hormone therapy has proved of little value in the control of cancer of the breast or of its metastases. (v) Breast cancer associated with pregnancy offers a poor prognosis. (vi) Sterilization of young women with cancer is advocated.

X-Ray Therapy in Arthritis, Bursitis and Allied Conditions.

ERNST A. POHLE AND JAMES A. MORTON (*Radiology*, July, 1947) have recorded their experience in the treatment of arthritis and allied diseases. The technique used was as follows. Either the 200 kilovolt or 400 kilovolt machine was used; for the spine 150r were given through a 10 by 20 centimetre port on each of three successive days; the joints were given the same dose through smaller ports. The need for caution in treating the lumbar and lumbosacral area in women under forty-five years of age is stressed, owing to the danger of causing amenorrhoea. Sometimes the treatments were repeated after an interval of four to six weeks; rarely a

third treatment was given. The conditions treated were osteoarthritis, rheumatoid arthritis, bursitis, peri-articular disease and osteoporosis. Of those suffering from arthritis, 66% experienced moderate or complete relief of pain, 26% no relief; the age of the patient and the severity of the disease were not reliable indications of results to be expected; occasionally an exacerbation of symptoms occurred lasting one or two weeks; improvement rarely occurred before three weeks following treatment and could be expected to last at least six months. Among those suffering from subdeltoid bursitis, the response to X-ray therapy was good; either complete or satisfactory relief occurred in 84% of all cases. Among these patients 50% had shown calcification in the lesion on X-ray examination before treatment was started. The authors state that calcification may or may not disappear following treatment, even when the clinical response is good. The authors conclude that the prime value of X-ray therapy in chronic arthritis, bursitis and allied conditions lies in the analgesic effect, although in acute bursitis the inflammatory process is also favourably influenced.

Cancer of the Body of the Uterus.

J. HEYMAN (*The British Journal of Radiology*, March, 1947) questions the views, sometimes taught, that carcinoma of the body of the uterus is a relatively rare disease, that hysterectomy is a simple procedure applicable in 80% of cases and that the results are satisfactory. He states, firstly, that out of 100 subjects of carcinoma of the uterus seen at the Radiumhemmet between 20 and 25 have carcinoma of the body. Secondly, surgery is not applicable to 80% of the lesions. It is true that the majority are technically operable, but many patients are bad operative "risks" because of old age, adiposity, heart conditions *et cetera*. Five-year cure rates by hysterectomy are difficult to estimate; only four reports are available for over 100 patients—the relative cure rates in these vary between 48% and 55%. The authorities at the Radiumhemmet have adopted a combined operative and radiotherapeutic treatment in which radiotherapy plays the primary and most important part. Since 1930 the method adopted has been the packing method, so called because the uterine cavity is packed with sufficient radium containers to fill it completely. In packing, either tubes containing eight milligrammes of radium or needles containing ten milligrammes are used, the filter of the wall being equivalent to one millimetre of lead. Each tube or needle is placed in an additional filter (which varies according to the size of the uterine cavity) with a wall thickness equivalent to two millimetres of lead. A special applicator is used for packing the cavity and the procedure is not difficult. Two treatments are given at intervals of three weeks; in one of the treatments radium is also applied to the vagina to prevent vaginal metastases. The patient goes home between the treatments. The following summarizes the results obtained. A total of 698 patients were seen, of whom 670 were treated. After five years 363 of these patients were alive without evidence of disease. The absolute cure rate was 52%, the relative cure rate 54.2%. In 87 of the patients the condition was inoperable, in 279 it was clinically inoperable, though technically operation was possible.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on July 31, 1947, at the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney, Dr. H. R. R. GRIEVE, the President, in the chair.

The Management of Hand Injuries.

DR. F. H. MC. CALLOW read a paper entitled "Management of Hand Injuries" (see page 349).

DR. L. J. WOODLAND read a paper entitled "Management of Hand Injuries, especially the Treatment of Injuries to Bones and Joints" (see page 351).

DR. C. C. MCKELLAR asked a question about pulp traction, for he had read somewhere that members of aircrews to whom that had been done became liable to suffer from frost-bite and he hoped for confirmation or otherwise on this point. Also it was remarkably easy for the wire to cut right through when screw traction was used. Median nerve injuries at the wrist, seen immediately after an accident, gave him some difficulty in diagnosis, for the loss of movement might easily be missed in the presence of an intact *flexor pollicis longus*, and because of the adduction and first dorsal interosseus muscle (ulnar nerve) as well as the *abductor pollicis longus* muscle (dorsal interosseus nerve) which not only was a flexor of the wrist but also sometimes attached to the *abductor pollicis brevis*. As to sensation (bearing in mind recent injury with some pain and numbness due to contusion or laceration and the intact sensation in the deeper tissues) it was not so easy either. The question of testing for circulation was always intriguing, and one had to remember that watching colour come and go on pressure was fallacious. Finally, on the cause of failure of a finger to flex after treatment in the extended position, while it was commonly due to shortening of the collateral ligaments, one interesting cause was the mechanical insufficiency of the flexor tendon to get a start on from just a shade of hyperextension. This happened sometimes following over-extension at the original trauma, and though 30° of passive flexion might be possible, the patient would be helpless to start active movement, yet once started could flex fairly well and even fully recover. The same principle applied to rheumatoid arthritis where the flexor had no chance at all in the presence of hyperextension.

DR. HUGH C. BARRY said that he had no argument whatever to put forward, and he agreed with the principles of what had been said by both speakers. He was of the same opinion as Dr. Callow that there was a great discrepancy between treatment in Sydney and treatment abroad, and he felt that there was a crying need for a traumatic centre in the city. Hand injuries were most important, and their modern specialized treatment was a speciality no less than surgery of any other region. Dr. Barry thought that it was quite wrong that treatment of such injuries was still relegated to a house surgeon. He mentioned his experience of working in the Albert Dock fracture clinic rehabilitation centre where a man with a fracture of the proximal phalanx of the finger was treated with as much care as a patient with a fractured femur. For every fracture the theatre was prepared, the surgeon was called and an anaesthetic was given if necessary. Most of the patients were injured on the docks and then treatment and rehabilitation were carried out in conjunction with a shipping company. The patient was not allowed to resume work until fully recovered, and every day from the day of the injury he attended the clinic. The present situation in Sydney where the patient was first seen in hospital and then referred back to his local doctor presented difficulties in the matter of early treatment by penicillin, admission to hospital *et cetera*, as the local practitioner might not be particularly interested in the field, but might be more interested in midwifery or a dozen other things. Dr. Barry said that it was impossible to make special reference to all the items which were involved in the treatment that had been mentioned by the speakers, but he hoped that before very long a central hospital would be established in Sydney for the treatment of traumatic lesions including hand injuries.

DR. H. R. R. GRIEVE thought it was deplorable that so few members of the profession had attended the meeting to hear the papers and to discuss such an important subject as injuries of the hand. The responsibility, he thought, lay with the large body of general practitioners because whatever methods were suggested for dealing with hand injuries

it would always be difficult, because of the geography of the country, to remove the burden of the work from the general practitioner. The suggestion made by Dr. Barry that there should be a central clinic for hand injuries would only partly cover the need because half of those injuries were found in the country, and it seemed to Dr. Grieve quite obvious that the defects which existed in the treatment of hand injuries, and which had been very well indicated by the two speakers, were such as could be overcome only by the proper spread of teaching. He, therefore, suggested that it was a matter for orthopaedic surgeons to spread their gospel and go out into the country as well as the metropolitan areas and teach the science of dealing with hand injuries. He also suggested that orthopaedic surgeons might begin in their own hospitals to teach more actively on this important question, and that, if necessary, they should agitate so that adequate attention might be given to teaching activities of this kind. Dr. Grieve agreed with Dr. Callow when he pointed out that very little attention was given to hand injuries in hospitals and that the job was left to the junior members of the staff. Dr. Grieve thought that both the papers were excellent and it was no criticism of Dr. Woodland's paper when he expressed the opinion that Dr. Callow's paper was one of the best he had heard on any subject. In Dr. Callow's paper Dr. Grieve thought that every word was in its right place and in correct perspective, and it was hardly likely to stimulate discussion because every word was established as truth. The only point that Dr. Callow might have emphasized was the need, if it could be so regarded as a need, for prophylaxis of sepsis. Dr. Grieve said that he would like to know the views of both speakers on this question and whether it might not be sound routine to have recourse to prophylaxis with penicillin as with antitetanic serum. Such a practice, particularly by those who had less specialized skill in the treatment of hand injuries, might serve to raise the recovery rate and diminish the functional incapacity rate. Another point raised by both speakers was in regard to rehabilitation. Dr. Grieve pointed out that it had become a matter of governmental action, and that might well be, because the profession itself had not been sufficiently active in organizing comprehensive enough measures of rehabilitation. If it so happened that the government handling of this problem did not make for maximum efficiency, it would be well to make sure that the profession was not responsible. Dr. Grieve stressed the fact that rehabilitation began at the very beginning of treatment of the injured hand or the injured part. Dr. Grieve asked whether it was not the responsibility of orthopaedic surgeons, particularly those interested in the problem of rehabilitation and those attached to the teaching hospitals, which were the obvious centres for the development of rehabilitation, to approach their boards and to organize the thing themselves. The British Medical Association, through its councils, had placed before the government representatives the view that the natural place for rehabilitation to commence was not some unsuitable establishment used temporarily and as a matter of expediency by a government organization for the purpose, but in the hospitals, particularly those large hospitals where the patients went in the first instance. Dr. Grieve said he hoped that his observations would stimulate orthopaedic surgeons to discussion and to activity. Dr. Grieve said that he felt orthopaedic surgeons should look to their laurels more than they did and also assert themselves more; if this was done the applause received would be surprising.

DR. A. S. JOHNSON congratulated both Dr. Callow and Dr. Woodland on their excellent papers. Dr. Johnson asked the speakers whether they considered that the introduction of the sulphonamides and penicillin powder, either alone or combined, had any effect in lessening the degree of infection which occurred in the wound. His own impression was that since the powder had been used locally, infection had been less common, but he had no statistics to support that view. Dr. Johnson stated that it was, of course, admitted that penicillin used parenterally did have the effect of lessening infection.

DR. T. S. DOUGLAS asked a question about pus. Did Dr. Callow remove pus from a tendon sheath and inject penicillin into the sheath?

DR. R. B. HOLLIDAY said that he thought the papers were very worthy papers. As he had dealt with hand infections he would refer to certain practical difficulties in the carrying out of hospital treatment. The usual practice adopted was that a patient went to a hospital and was referred to a private practitioner. The private practitioner then had great difficulty in placing the patient in hospital as many of such patients made workers' compensation claims; they were covered by a certain rate and most hospitals would not accept such patients. Dr. Holliday thought there should

be a move to make it easier for general practitioners to get such patients into hospitals and to secure for them the necessary specialized treatment, manipulation, immobilization *et cetera*. He thought that the present compensation rate was three and a half guineas a week and most hospitals would not accept this. Such a practical point should have attention and the rates should be raised so that patients could be given adequate treatment.

Dr. A. C. THOMAS said that it was a great pity that there were so few members present to hear the excellent papers presented. For some years as a general practitioner in an industrial area he had had to deal with a great number of hand injuries and he had not been satisfied that the patients had always had the best treatment. As the last speaker had mentioned, it was not always possible to get these patients admitted to hospital. Dr. Thomas said that the rate of payment was not three and a half guineas, but only three guineas, for compensation cases, and it was impossible to get the patients into private hospitals and only possible to get them into public hospitals if the board so allowed. Dr. Thomas was of the opinion that with the introduction of sulphonamides and penicillin, cases of hand injuries certainly had improved considerably. He also thought that it was necessary to have in view right from the beginning of treatment the ultimate aim of what had to be done, and that was complete rehabilitation or restoration of function of the hand. To do this it was essential to control sepsis which was very common, almost universal, except in these latter days, after the introduction of penicillin. He also thought that these patients were better treated in what was known as a hand clinic. Dr. Thomas said he understood that at the Sydney Hospital there was a hand clinic where such patients were all treated by the one surgeon and that was an ideal arrangement. At the same time he realized that these patients were treated by the general practitioner, but thought that they should be treated by them after consultation and under the control of someone who had had a lot of experience. Dr. Thomas said that the two papers had stressed weaknesses, and if what the two speakers had said was taken to heart, a great deal would be done towards helping patients affected by accidents of this nature and by infections. Dr. Thomas thanked Dr. Callow and Dr. Woodland for their papers.

Dr. F. H. M. Callow, in reply to Dr. C. C. McKellar, said that he had used pulp traction on many scores of patients without difficulty. Once or twice it had shown signs of tearing through, but it was practically painless if properly arranged, and the traction and pulp must be carefully considered all the time. The fact that aircrews had trouble with frostbite was something Dr. Callow did not know, but he did know that the Royal Air Force personnel with bone grafts had complained of severe pain when they flew above a certain altitude. The test of circulation, in Dr. Callow's opinion, was much the same as the test of a dead person—one look was sufficient. In regard to the teaching aspect, Dr. Callow said that in his own way he did what he could at the Royal Prince Alfred Hospital, even to the point of being accused of evangelical fervour. He proposed to continue this evangelism. The President, Dr. H. R. Grieve, had mentioned prophylaxis for sepsis, and Dr. Callow agreed that both sulphanilamide and penicillin powder were useful. The actual cleansing of the wound was really most important, but Dr. Callow said that he always used a little penicillin and sulphanilamide powder, and that in his opinion it had improved the outlook in hand injuries, although whether this was due to penicillin or the careful handling of the wound he did not know. With regard to the question of infection and the tendon sheath, Dr. Callow thought that incision and treatment with sulphanilamide and penicillin powder were advisable. Replying to Dr. Holliday's remarks about getting patients into hospital, Dr. Callow said that he experienced the same difficulty, and only that day had spent an hour trying to get a patient into hospital, only in the end to have to send the patient home. He felt very strongly on this subject. He thanked the speakers for their remarks.

Dr. L. Woodland, in reply, thanked the speakers for their remarks and for the way in which they had received the papers. As Dr. Callow had answered most of the questions, Dr. Woodland said that he would touch on just a few points. The question of getting patients into private hospitals for a fee of three and a half guineas per week was worthy of mention because of the medical man who received only two guineas for attending a patient for proximal phalanx injury. In reply to the President's remarks on rehabilitation, Dr. Woodland was of the opinion that this was a matter for the Branch Council and not for the hospitals. It was a medico-political matter, and Dr. Woodland thought that industrial undertakings which provided rehabilitation should have their

insurance premiums reduced as it was a continual battle between insurance companies and employers. The employer did not want the patient back at work until he could do a full-time job, and from this viewpoint it was a medico-political matter and not one for the hospitals at all. With regard to sepsis of the hand, Dr. Woodland thought penicillin therapy should be used as a routine procedure in cases of hand injuries, but he agreed with Dr. Callow that that was no excuse for bad surgery. The treatment of suppurative tenosynovitis in Dr. Woodland's opinion was best carried out by penicillin injections and by incision and drainage of the distended proximal end of the infected tendon sheath. The best incisions were Henry's bilateral through-and-through incisions. This method of treatment, provided it was not unduly delayed, usually enabled one to secure a full return of function.

Dr. H. R. R. GRIEVE, from the chair, thanked Dr. Callow and Dr. Woodland on behalf of the members present for their excellent papers. Dr. Grieve said that with reference to the last point raised by Dr. Woodland he would like to have it known that the Branch Council in New South Wales and the Federal Council had treated this matter as a medico-political one and had represented their views on the whole question of rehabilitation to the Government very strongly. Some five years previously a committee of the Branch had formulated a report on the whole question and that report had been subsequently adopted by the Federal Council. As a result of that report certain recommendations had been made such as those suggested by Dr. Woodland. It was felt, however, that rehabilitation really began at the beginning of treatment, that the development of portion of the rehabilitation scheme was essentially a matter for the hospitals, and that other phases of it, such as occupational therapy, involved liaison officers and so on, but the hospitals came into the picture at least because of their participation in the first stages. The Federal Council had continued its discussions with the Federal Government on this matter of rehabilitation, and it might be of interest to members to know that the Social Service Department of the Commonwealth Government had already a very large organization working, and according to the views of the Council, working in a way which was not desirable. Dr. Grieve said that this matter was one which should be discussed at a later date.

A MEETING of the South Australian Branch of the British Medical Association was held on May 31, 1947, at Riverton, Dr. L. R. MALLIN, the President, in the chair.

Pelvic Inflammation.

Dr. R. F. MATTERS read a paper entitled "Pelvic Inflammation" (see page 354).

Dr. H. M. FISHER, in opening the discussion, congratulated Dr. Matters on his paper. Dr. Fisher said that he felt that his task was unenviable, as Dr. Matters had covered such a wide field. With regard to the term "metritis", Dr. Fisher drew the attention of members to the condition as resulting from the use of so-called contraceptives, notably the Graefenberg ring. Dr. Fisher mentioned this to condemn it unreservedly as a most dangerous and unscientific assault on a uterus. It was in no sense of the term a contraceptive, but rather a permanent abortifacient, which induced chronic pelvic congestion and inflammation of all the pelvic organs. Discussing *Clostridium welchii* and *Clostridium tetani* infections, Dr. Fisher pointed out the importance of early hysterectomy as holding out the only good chance of recovery, and cited a recent successful case of his at the Royal Adelaide Hospital. He said that the use of penicillin and serum in addition was, of course, a *sine qua non*. In the diagnosis of peritonitis following childbirth, the sign of abdominal rigidity was a dangerous one on which to rely, as many of these patients with stretched abdominal walls were not rigid, even though frank pus was present in the abdominal cavity. With regard to cauterization of the cervix, Dr. Fisher considered the dangers of the use of diathermy in unskilled hands as being much greater than those of the electric cautery. The depth of coagulation was hard to judge, even for skilled operators, and stenosis of the cervix was prone to follow if too deep a coagulation occurred. This was almost impossible with the electric cautery, which could be used with safety by any practitioner who realized that several treatments were much preferable to the overdoing of things at any one "sitting". With regard to the treatment of *Trichomonas vaginalis* infection, Dr. Fisher stressed the importance of adequate treatment during menstruation by means of thorough drying of the vagina followed by the insufflation of silver picrate powder.

DR. F. L. WALL asked Dr. Matters for the recommended treatment for monilial vaginitis in a woman thirty-five weeks pregnant.

DR. W. H. BAUDINET asked how Dr. Fisher managed to cauterize the cervix without an anæsthetic. Commenting on Dr. Matters' treatment of chronic cervicitis by amputation, Dr. Baudinet asked what was the result when pregnancy followed, and whether there was any danger of rupture of the uterus.

DR. M. H. DRAPER deprecated the indiscriminate use of penicillin and the sulphonamides in all cases of pelvic infection in a haphazard and unscientific panic. He advocated the sequence of sulphonamides and then penicillin.

DR. H. E. PELLEW stressed the disappointing results of treatment in many cases of *Trichomonas vaginalis* infection. He believed that the true answer had not yet been found to the question whether the trichomonas was the prime factor in the condition.

Dr. Matters, in reply, agreed wholeheartedly with Dr. Fisher's condemnation of the Grafenberg ring, which he considered in many cases led to permanent sterility. With regard to amputation of the cervix, Dr. Matters said that he hesitated to do this to young women, and advocated Schlink's method of trying endocrine therapy. Dr. Matters was inclined to agree with Dr. Baudinet, that his patients also were perhaps not so placid as Dr. Fisher's as to allow repeated cauterization. In reply to Dr. Draper, Dr. Matters said that results were what was aimed at, and he never hesitated to give penicillin and sulphonamides at once. The leucocyte count, of course, had to be watched when large doses of sulphonamide were used.

World Medical Association.

INQUIRY INTO THE PRESENT POSITION OF THE MEDICAL PROFESSION AND ITS RELATION TO THE STATE.

THE following reply to a questionnaire recently forwarded to the Federal Council of the British Medical Association in Australia by the World Medical Association is published at the request of the Federal Council.

I. Professional Organization.

1. What is the population of your country?

7,500,000 (approximately).

2. What authority is responsible for the registration of medical practitioners, that is, the conferment of the legal recognition of their title to practise?

There is a lack of uniformity in the conditions and qualifications for medical registration throughout the Commonwealth of Australia. Each of the six States has its own *Medical Act*, and the Federal Capital Territory has its *Medical Practitioners Registration Ordinance*. In each case the administering authority is the Medical Board, a statutory body.

3. Is there a medical register of (a) general practitioners, (b) consultants and specialists?

There is a medical register in each of the six States and in the Federal Capital Territory, but there is no distinction between general practitioners and consultants and specialists excepting in Queensland, where there is a separate register of consultants and specialists.

4. How many medical practitioners are there?

7137.

5. If possible, analyse this total number into:

General practitioners	4300
Consultants and specialists	1256
Hospital staffs	562
Whole-time central Government Service	394
Whole-time local Government Service	1
Whole-time teachers and research workers	88
Others (retired, in the armed forces, post-graduates)	536

6. Is there a professional medical organization representative of the majority of the profession?

Yes, the British Medical Association in Australia.

7. What is its status in relation to (a) the profession, (b) the Government?

(a) It is the only organization which represents the views of the profession as a whole and to an unlimited extent. The

great majority (86.5%) of members of the profession are members of the Association.

(b) It is recognized as the body which speaks for and on behalf of the profession and frequently is consulted by and makes representations to governments.

8. What is its present membership?

6175.

9. What proportion is this of the total profession?

86.5%.

10. What is the criterion of eligibility for membership? Is membership voluntary or compulsory?

A legally qualified medical practitioner on the nomination of two members, who are required to state that from personal knowledge they consider him a suitable person for election, may be elected a member.

Membership is voluntary.

11. Give a very brief account of the structure of the professional organization.

The British Medical Association in Australia is an integral part of the British Medical Association. There is a Branch in each State (New South Wales, Queensland, South Australia, Tasmania, Victoria and Western Australia) and their objects, powers and obligations coincide with the objects, powers and obligations of the Parent Association. Within the constitution of the Association the Branches possess a great deal of autonomy, each with a Council as executive body, managing its own affairs. Four of the Branches are incorporated, and two are not. The Federal Council, a corporate body, is composed of fifteen members nominated by the Branches as follows: New South Wales, four (4); Victoria, three (3); Queensland, two (2); South Australia, two (2); Western Australia, two (2); Tasmania, two (2). Its objects are in general those of the British Medical Association; and in particular to act for and on behalf of the Branches collectively in matters affecting the profession in Australia as a whole.

II. Present Tendencies in Medical Practice.

12. Give a brief account (about 500 words) of the events relating to the organization of medical services during the last ten years, showing especially (a) whether there is a tendency for change in the sphere of the organization of medical services, either by natural development or by imposition; (b) from whom came the initiative for any changes, the profession or the State; (c) the reasons for the changes or proposed changes; (d) the general nature of the changes or proposals; (e) the present position.

Up till 1946 all powers relating to health services other than in respect to quarantine were vested in the six States, each of which initiated its own legislation. Up till about ten years ago the organization of these services was fairly typical of that in English-speaking countries in that they were rendered:

(a) By the State, which concerned itself in the main with environmental factors and the provision of hospital treatment for those members of the community unable to pay for the cost of medical care.

The staffs of public hospitals, excepting for essential administrative personnel, were composed of visiting medical officers who rendered their services in an honorary capacity.

(b) By private practitioners—either on a fee-for-service or a contract (capitation) basis.

Although State governments have, particularly since the Great War, 1914-1918, taken a greater interest in personal health services, especially the care of the mother and child, there has been no great change in the organization of health services in four of the States, viz., New South Wales, Victoria, South Australia and Western Australia.

In two of the States, Tasmania and Queensland, however, there have been important changes. In Tasmania in 1937 the Government introduced a "free" medical service ostensibly as a means of providing medical care to isolated communities which were unable to support a private medical service. However, the service has not been confined to isolated communities, and government medical officers, who are full-time salaried officers, have been placed in towns where there were already private practitioners. There are now sixteen areas in which the services of a medical practitioner are available without charge. Public hospital services in Tasmania are free to all. Whilst medical practitioners have in the past been willing to provide honorary services, they are now asking for payment, and negotiations are proceeding between the Government and representatives of the profession. A recent development is the employment by the main hospitals of specialists in a full-time capacity.

In Queensland, because voluntary medical charity was discouraged and the Government made itself responsible for the complete financial provision of public hospital care, at the same time offering such care to all members of the community, the visiting staffs of the main metropolitan hospitals initiated a change from voluntary to paid part-time service. In country towns the general government tendency is to staff the smaller hospitals with full-time and part-time salaried medical officers, and here to a greater extent than in the metropolitan areas the superior facilities of the hospital service compete severely with private practitioners having no hospital affiliation.

As stated before, up till 1946 all powers relating to health services, other than in respect to quarantine, were vested in the States, the Commonwealth Parliament under its Constitution only having power to make laws in respect to quarantine.

In 1938 the Commonwealth Government of the day under the powers granted it in relation to "Insurance" passed a *National Health Insurance Act* similar to the corresponding act in Great Britain, under which a medical service was to be provided to insured persons. Because the service was to be limited to insured persons and did not include their dependants, and because the capitation fee to be paid to medical practitioners, viz., eleven shillings per insured person per year, was regarded as being wholly inadequate if a proper service were to be provided, the organized medical profession refused to cooperate with the Government, and as a result the act was never proclaimed.

In 1944-1945 the Commonwealth Government passed a *Pharmaceutical Benefits Act* under which drugs and medicinal compounds, listed in a "Commonwealth Formulary", were to have been supplied free to the people of Australia on the prescription of a medical practitioner. Because in its opinion the measure interfered indirectly with the traditional right of the practitioner to prescribe for his patient as he saw fit, the organized profession refused to cooperate with the Government. The Attorney-General of a State, Victoria, acting on the relation of the Medical Society of Victoria, challenged the constitutional validity of the act in the High Court of Australia, and the legislation was declared to be outside the then constitutional powers of the Commonwealth Government. In 1946 the people by referendum transferred health powers to the Commonwealth Government, and these powers appear to be unlimited. In 1947 the Commonwealth Government under its new powers reenacted the *Pharmaceutical Benefits Act*. Cooperation of the profession with the Government in the working of the act will depend on the result of negotiations which are at present proceeding between the Government and the Federal Council of the British Medical Association. It may be said that the profession is still opposed to any restriction, direct or indirect, on its right to prescribe, and to any legislation which imposes special penalties on practitioners for "offences" under such legislation.

The Commonwealth Government has announced its intention of establishing a complete medical service to every member of the community without direct cost to the individual. The details of how this is to be done are not yet known to the profession, but the Commonwealth Minister for Health has requested the Federal Council of the British Medical Association to meet him in conference on July 21, 1947, for the purpose of discussing the Government's plans.

In 1945 the Commonwealth Government under its financial powers passed a *Hospital Benefits Act* which provides that the Commonwealth shall, subject to compliance by the State with the provisions of the act, pay to the State by way of financial assistance, in respect of beds occupied by patients in public and non-public wards in public hospitals, not including those whose fees are borne by the Commonwealth or who have received or are entitled to receive these fees under any law in force in the State, the sum of six shillings *per diem*. One of the provisions of the act is that the State shall ensure that no means test is imposed on and that no fees are charged to or in respect of persons occupying beds in public wards in public hospitals. In effect, the act abolishes the "means" test in respect of persons admitted to public beds in public hospitals. A person who desires to occupy a non-public bed in a public hospital receives the benefit of six shillings *per diem*, but may be charged by the hospital for services rendered. The act also provides that the benefit shall be available to patients in private hospitals.

To sum up:

- (a) Changes have taken place in the organization of medical services chiefly by natural development, but during the past ten years to some extent by imposition.
- (b) The medical profession has taken an active part in the development of the health services of Australia

and many of the changes that have taken place have been due to its initiative. Improvements in the care of sufferers from chronic diseases such as tuberculosis (which even yet is not what the profession considers adequate), in hospital services, in nutrition and housing, and in the education of the public in health matters have been brought about in part as a result of the persistent advocacy of the profession, and it was largely as a result of the profession's representations that State-wide campaigns of immunization against diphtheria were introduced. Governments have been responsible for improvements in the environmental services, and to their credit, for the better care of mothers and babies. The proposal that medical services shall be "free" comes from the Commonwealth Government.

- (c) The reasons for the changes are briefly: (i) modern developments in medicine, (ii) the greater interest which governments have taken in recent years in the health and well-being of the individual and of the community as a whole, (iii) the demand for economic and social security.

13. *Have there been in this field negotiations or consultations during the last ten years between the Government and the professional organization? If so, on what topics and with what results?*

Yes, as stated in the answer to Question 12, there have been negotiations, but these have been mainly for the purpose of informing the profession of government plans and not of obtaining the assistance of the profession in formulating these plans. The failure to properly consult the profession has resulted in augmenting the profession's objections to revolutionary changes in medical practice, and, on two occasions, in a government not proclaiming an act.

14. *What fundamental principles have been adopted by the profession in its attitude towards developmental changes or in its resistance to or criticism of the proposals of the Government or other outside body?*

The principles adopted have been:

1. Maintenance of the doctor-patient relationship, i.e., the right of the patient to choose his own doctor, and the right of the doctor to accept or refuse a patient requiring his services; and the absence of intervention between doctor and patient by a third party.
2. Freedom to prescribe.
3. Freedom of the doctor to practise wherever he desires and to act within the dictates of his own conscience.
4. Adequate representation on any controlling body.
5. Opposition of the profession to a salaried medical service on the ground that it is not in the interest of the public.

15. *Are these principles observed in the present proposals or tendencies for change? If not, in what way is there conflict?*

The plans of the Commonwealth Government for a national medical service have not been disclosed.

16. *What action is being taken by the profession to preserve these principles?*

The Federal Council of the British Medical Association has informed the Government of the fundamental principles adopted by the profession, and of its opposition to a policy of "free" medical service to all with control by a government department and a contract for service between the Government and the doctor.

17. *What is the general reaction of the profession to present proposals or tendencies for change?*

Vide answers to Questions 12, 14 and 16.

The profession, through the Federal Council of the British Medical Association, has offered to the Government its fullest cooperation in bringing about any of the following improvements in the medical services to the community.

A. Maternal and child welfare.

Since the security and prosperity of Australia depend upon a rapid and progressive increase in the indigenous population, we strongly urge that everything possible should be done to encourage people to marry earlier and have larger families. This should result if the Government gave a clear lead by providing better housing facilities, by ensuring that there is available to every mother and child a daily sufficiency of the protective foods, by financially assisting those prepared to undertake parenthood, and by making provision to improve the amenities and lessen the drudgery of family life.

To give this policy concrete shape, the Federal Council recommends the Government to subsidize, through the State

Governments, the provision daily to each child attending school of a luncheon of the type and nutritive value of the Oslo lunch.

We would stress also the importance of better supervision of the mental and physical health of every child from birth to adult life. There should be a much greater availability and wider use of day nurseries, crèches and kindergartens, the provision of a greatly increased number of spacious playgrounds, and careful medical supervision of school children for evidence of under-nutrition, nervous instability and other minor departures from health, and more extensive immunization against diphtheria, whooping-cough and other diseases from which protective immunity may become possible.

We regard these matters as the most urgent health needs of the Commonwealth at the present time.

B. Problem of tuberculosis.

A living wage allowance to tuberculous breadwinners and greatly increased facilities for diagnosis and treatment of tuberculous sufferers, including the construction of sanatoria.

The Federal Council, like the National Health and Medical Research Council, has from time to time directed the attention of governments, both present and past, to the urgent need of dealing with this problem.

C. Construction and extension of hospitals, including addition of pathological laboratories, X-ray departments and all facilities for efficient diagnosis and treatment of injuries and disease, according to a decentralized plan.

There is a glaring deficiency in accommodation for sub-acute and chronic diseases.

D. Extensions under the present control of the Flying Doctor Service, including aerial nursing services, aerial ambulance transport, X-ray, pathological and other aids to efficient diagnosis, to be carried for patients in the outback.

E. Increased subsidized medical practitioner service to outback areas.

F. Increased grants, through present agencies, for post-graduate education.

G. Subsidizing popular medical education.

H. Grants to the universities in aid of the teaching of and research into industrial medicine so as to improve the health of and increase the measure of safety to the worker.

I. Recent changes in the form of treatment of the most common type of venereal disease underlines the importance of maintaining secrecy in relation to this complaint by allowing and if necessary subsidizing treatment under ordinary practice conditions away from venereal clinics.

J. Adequate provision for research, preferably a permanent annual sum. At present the period and the amount of the annual grant is liable to be varied at any time.

III. Organization of Medical Services.

18. What is the general organization of medical services?

(a) Is a central government authority responsible for the administration of the nation's health services, either wholly or in part? What provision does it make for: (i) Public health, e.g., environmental factors? (ii) Care and treatment of patients?

(b) What part do local government authorities play in the administration of health services? What provision does it make for: (i) Public health, e.g., environmental factors? (ii) Care and treatment of patients?

(c) Is there efficient coordination between the different branches of medical service?

(d) Is there a scheme of social security or national health insurance? If so, what benefits does it provide and what medical services does it cover?

(a) Vide answer to Question 12.

The State governments have in varying degrees been responsible for health services comprising: (i) Environmental factors such as food standards, sanitation, buildings, etc. (ii) Infectious diseases, tuberculosis, venereal diseases, mental diseases, school medical services, general medical services in remote areas, maternal and infant welfare and public hospitals.

The Commonwealth Government, although, as previously stated, prior to 1946, having no health powers excepting those relating to quarantine, has over the past twenty years established the Commonwealth Serum Laboratories, which manufacture biological products, such as sera, vaccines and penicillin, and also diagnostic laboratories providing pathological facilities in Kalgoorlie (Western Australia), Bendigo (Victoria), Hobart (Tasmania), Lismore (New South Wales) and Townsville (Queensland). The Commonwealth Government is also responsible through the Department of Repatriation for the provision of medical services to ex-service personnel with a disability attributable to war service, and through the Department of Social Services for the provision

of medical services to ex-service personnel with a disability not attributable to war service and which causes incapacity lasting more than six weeks.

(b) In general very little part is played by local authorities in the administration of health services. They are in the main concerned with environmental factors, and have little to do with personal health services.

(c) There is a measure of coordination in the different States, but there is still much room for improvement, especially in the correlation of government and non-government services.

(d) No.

19. In schemes of national health insurance or services provided by the State are the following principles generally observed? (a) Free choice of doctor; (b) liberty of prescription and treatment; (c) professional secrecy. If not, in what way are they restricted?

(a) There is no scheme of national health insurance in Australia. In isolated areas where medical services are provided by the State there is usually only one medical officer.

(b) Yes, up to the present. (Vide answer to Question 12.)

(c) Yes.

IV. Conditions of General Practice.

20. Is general practice conducted privately and independently of government control?

Yes, except where the State provides general medical services in sparsely populated areas.

21. Has the general practitioner any relation, in respect of contract or employment, with (a) the central government authority; (b) a local government authority; (c) a local statutory body, e.g., committee for national health insurance; (d) insurance bodies. If so, what is the nature of the contract or relationship?

(a) Yes.

1. The Repatriation Department, a central Commonwealth authority, arranges for the provision of—

i. A medical service to men and women who have served in the armed services, and who are suffering from disabilities accepted as being due to war service. A general practitioner who, at the request of the Repatriation Department, provides such medical service, is paid by the department on a fee-for-service basis, the scale of fees being mutually agreed upon by the department and the Federal Council of the British Medical Association.

ii. A medical service to widows and orphans of deceased members of the armed forces whose deaths are attributable to war service. General practitioners, who provide this service, under an agreement mutually agreed upon by the Repatriation Department and the Federal Council of the British Medical Association, are paid on a capitation basis, the rate being 32s. 4d. in metropolitan areas and 39s. 10d. in country areas.

2. At the present time the Social Service Department, a central Commonwealth authority, is completing negotiations with the Federal Council of the British Medical Association in regard to the provision of a medical service to ex-members of the armed forces suffering from disabilities not attributable to war service. Payment of general practitioners is to be on a fee-for-service basis.

3. In one State, New South Wales, the Government arranges through the British Medical Association for the provision of a medical service to unemployed persons. General practitioners who render this service are paid on a capitation basis.

(b) Yes. In some States medical practitioners are employed by local authorities in a part-time capacity.

(c) No.

(d) i. About 25% of the community in Australia receives its general practitioner care through membership of friendly societies, and, in some areas, mining lodges. A Common Form of Agreement mutually agreed upon by the friendly societies and the British Medical Association provides for payment of the lodge medical officer at rates which differ slightly in the different States, but which in the two largest States are twenty-six shillings per lodge member per annum in the metropolitan area and thirty-two shillings in country areas. If medicine is supplied an extra twelve shillings is payable to the practitioner.

ii. In each State under the provisions of the *Workers' Compensation Act* an injured workman entitled to

the benefits of the act receives not only compensation but the cost of medical treatment up to a specified amount (£25). By arrangement with insurance companies, with whom employers insure themselves against the risk of accident to their employees, medical practitioners who attend such injured workmen and who look to the insured for payment instead of exercising their legal right of looking to the patient receive payment on a fee-for-service basis in accordance with a Schedule of Fees agreed upon by insurers and the British Medical Association.

22. How does the general practitioner receive his remuneration, e.g.: (a) Directly from the patient; (j) by salary from the State or statutory body; (c) by capitation fee paid by the State or other body; (d) by fee per service paid by the State or other body; (e) by fee or salary from an independent body (e.g., hospital) subsidized by the State; (f) any other method?

(a) In the main directly from the patient either on a fee-for-service or capitation basis. (See answer to Question 21.)

(b) i. In one State, Tasmania, sixteen medical officers are employed by the Government in a full-time capacity in country districts to provide a general practitioner service.

ii. Medical officers of health employed in part-time capacity by local authorities receive payment by salary.

(c) See answer to 21 (a) and 21 (d) i above.

(d) See answer to 21 (a) and 21 (d) ii above.

(e) In some States general practitioners who render services to public hospitals in sparsely populated areas receive salary payment from the hospital.

(f) In one State, New South Wales, in sparsely populated areas general practitioners are subsidized by local committees so as to bring their income up to a reasonable amount (usually £1000 per annum).

23. How does a doctor enter general practice? Is he subject to any control in his choice of practice or district? If so, by what authority (State or other)?

By purchase of an existing practice or a share in an existing practice or simply by "putting up his plate". He is not subject to any control either in choice of practice or locality.

24. How are practices transferred from one doctor to another, e.g., on death, retirement or removal?

Practices are transferred by sale. The selling price of a city practice is usually the yearly average of three years' gross takings, of a country practice two-thirds (2/3) of the yearly average of three years' gross takings.

V. Conditions of Consultant and Specialist Practice.

25. Is consultant and specialist practice conducted privately and independently of government control?

Yes, generally speaking. In one State, Queensland, it is illegal to claim qualification as a specialist unless registered as such by the Medical Board.

26. How does a doctor enter consultant or specialist practice? Is he subject to any control in his choice of practice or district? If so, by what authority (State or other)?

A consultant or specialist enters practice by entering into partnership with another consultant or by "putting up his plate". In general, consultant and specialist practices are not bought and sold as are general practices. A consultant or specialist is not subject to any control except in Queensland, in which State the Medical Act restricts specialist practice to those who qualify under the act for entry in the Register of Specialists. The act demands the possession of a higher degree or diploma and certain hospital experience.

27. Are consultants and specialists usually attached to the staff of a hospital? If so, are they honorary or paid by salary or other method? And are they allowed private practice?

Yes.
In most of the States consultants and specialists render their services part time in an honorary capacity, but in recent years there has been a tendency to pay some of the visiting staff, more particularly pathologists, radiologists and anaesthetists, usually on a sessional basis, but sometimes by salary. Consultants and specialists attending hospitals under the control of the Repatriation Department, a central Commonwealth authority, are paid on a sessional basis. A few specialists, mainly pathologists and radiologists, are employed full time on salaries in hospitals without the right of private practice.

In one State, Queensland, the great majority of specialists are now paid for their services to public hospitals, the

honorary system having practically ceased to exist. Specialists are employed part time, the terms and conditions of service being exemplified by those pertaining to the visiting staff of the Brisbane General Hospital a teaching hospital and the largest hospital in the State, viz.:

Weekly.	Seniors.	Juniors.	Assistants.
2 three-hour sessions ..	£400	£300	£250
3 three-hour sessions ..	£600	£450	£375
4 three-hour sessions ..	£800	£600	—

Salary includes four weeks' annual recreation leave on full pay. Members of the visiting staff performing teaching duties are paid an additional salary of £60 per annum by the University of Queensland.

28. How are hospitals maintained? (a) By the central government authority; (b) by a local government authority; (c) by private enterprise?

(a) Yes, in the main by government authority. Each State maintains its own public hospital system, including mental hospitals and tuberculosis sanatoria, the greater part of the necessary finance coming from grants from consolidated revenue; a small proportion from payments by patients and from charitable gifts. The Commonwealth Government maintains the repatriation hospitals and one hospital in the capital city, Canberra.

(b) Practically not at all. In Victoria an infectious disease hospital is maintained by local government authorities and certain wards attached to country hospitals are similarly maintained.

(c) Yes.

Private hospitals fall into three groups—

ii. Those owned and carried on for profit by proprietors who are, in practically all cases, trained nurses. In recent years due to difficulty in obtaining nursing and domestic staffs many of these hospitals have ceased to function.

ii. A considerable group conducted by denominational organizations, i.e., Anglican Church, Presbyterian Church, Methodist Church, Roman Catholic Church, the Salvation Army, and the Freemasons.

iii. In Victoria some 65 hospitals providing 700 to 800 beds scattered throughout the country are maintained by local cooperative effort under the auspices of the Bush Nursing Association.

29. With whom does the hospital consultant or specialist enter into contract, e.g., the individual hospital or a statutory body, in each type of hospital mentioned in Question 28?

In the case of public hospitals, with the board of management of the individual hospital. Consultants and specialists attached to repatriation hospitals are appointed by the Repatriation Department, a central Commonwealth authority.

Private hospitals do not employ visiting staffs.

30. Does the consultant or specialist take any part in the administration of his hospital, e.g., by membership of the Committee of Management?

In general, a consultant or specialist is precluded from being a member of the Board (Committee) of Management of the hospital of which he is a member of the staff. However, in respect of the teaching hospitals in Victoria and New South Wales this is not so, and in several cases a member of the staff is President of the Board of Management.

31. Is the medical administration of the hospital in the hands of its medical staff or of a non-medical management?

In the larger hospitals, e.g., teaching hospitals, medical administration is in the hands of the medical superintendent, who is commonly also the chief executive officer. He is, however, subject to the control of the Board of Management composed often of lay persons only.

In the smaller hospitals, whilst a lay secretary is generally the chief executive officer, there is usually no interference with the care and treatment of patients by the medical staff.

VI. Medical Services in Industry.

32. Is any special medical service provided for workers in industrial and other undertakings during their hours of work? If so, briefly describe its nature and scope.

Industrial medical services are not well developed. In recent years, however, greater interest has been taken by industrial concerns in the welfare of their employees, and a few now employ medical officers in a full-time capacity, and a number employ medical officers part time. The medical officers act as general advisers on medical matters connected with the industry and in regard to the preservation of health among the workers, and examine candidates for employment and render first aid to injured employees.

In several of the States divisions of industrial hygiene exist in the State Departments of Health. Specialist medical officers carry out investigations and research, advising upon and coordinating health aspects of State activities in the industrial field. Administratively, in all States, separate departments of labour and industry, mines and other agencies control conditions of work in industry.

VII. Medical Education and Research.

33. What part, if any, does the central or local government play in (a) medical education, (b) medical research?

(a) 1. Undergraduate medical education is provided in the medical schools in the States of Queensland, New South Wales, Victoria and South Australia, which receive financial support from their respective State Governments. It is more than likely that in the near future a medical school will be established in Western Australia, in which State all university education is free, the cost being borne entirely by the Government.

In recent years the Commonwealth Government has subsidized the cost of medical education of individual students (the children of parents of the lower income group) through the Universities Commission, a central authority, and it also assists ex-service personnel.

ii. Post-graduate medical education is provided either by the universities which have committees specially constituted for this purpose, or, in the case of Victoria, by the Melbourne Permanent Post-Graduate Committee, which receives financial grants from the State Government and the Universities Commission.

(b) Medical research. In Queensland an Institute of Medical Research has recently been established by the Government which proposes to spend £30,000 a year on research. In the other States the Governments subsidize to a limited extent research institutes attached to universities and larger hospitals.

The National Health and Medical Research Council, a central Commonwealth body, makes financial grants to research workers and to research institutes. It has no permanent endowment, depending on parliamentary grant. The amount of the grant has varied from year to year, and for the forthcoming year will be £50,000, the largest grant so far made.

Altogether the amount of money allocated by Commonwealth and State governments does not exceed £120,000 per annum.

VIII. Status of Medical Practitioners.

34. What is the general level of the remuneration and social standing of medical practitioners as compared with those of members of other professions?

In general, the average remuneration of members of the medical profession compares more than favourably with that of members of other professions.

The social status is high.

35. What is the general attitude of the public towards the medical profession?

The individual practitioner is held in high regard by the public and by his patients. The organized profession, however, at times is subject to hostile criticism from the public, politicians and the lay Press.

J. G. HUNTER,
General Secretary, Federal Council
of the British Medical Association
in Australia.

June 27, 1947.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 167, of September 4, 1947.

CITIZEN NAVAL FORCES OF THE COMMONWEALTH.

Royal Australian Naval Reserve.

Honorary Rank.—Honorary Surgeon Commanders George Bell, O.B.E., and Archibald John Collins, D.S.O., M.C., are promoted to the rank of Honorary Surgeon Captain, dated 28th July, 1947.

AUSTRALIAN MILITARY FORCES.

Australian Army Medical Corps.

NX215 Lieutenant-Colonel R. Drummond, M.B.E., ceases to be seconded for duty with the Australian Imperial Force and resumes duty with the Active Citizen Military Forces (part-time duty), 17th January, 1947.

2nd Australian Out-Patients' Depot.—The rank of VX39814 Captain (Temporary Major) S. E. Francis, which appeared in Executive Minute No. 245 of 1946, promulgated in *Commonwealth Gazette* No. 229 of 1946, is amended to read "Major".

Reserve of Officers.

The undermentioned officers are transferred to the Reserve of Officers on the dates indicated. Where applicable, they cease to be seconded and relinquish any temporary rank held with effect from the date of transfer to the Reserve of Officers:

Captains NX205274 R. W. Fay, 26th February, 1947, SX33399 T. P. Dearlove, 13th March, 1947, VX39490 H. B. Hattam, 17th January, 1947, and NX205348 J. S. Norton, 26th March, 1947.

101st Australian General Hospital.—Captains SX28896 P. S. Eyles, 27th March, 1947, and NX203564 H. C. Turk, 25th February, 1947.

No. 105 (Adelaide) **Military Hospital.**—Captains SX34116 J. A. B. Rolland, 27th March, 1947, SX19000 A. G. Rowe, 5th March, 1947, and SX34515 C. J. Helman, 4th April, 1947.

* No. 110 (Perth) **Military Hospital.**—Captains NX208034 E. J. Halliday, 26th March, 1947, NX203549 A. C. Christie, 19th March, 1947, and NX206853 J. M. Farrar, 7th March, 1947.

No. 112 (Brisbane) **Military Hospital.**—NX208072 Captain W. D. Rimmer, 18th March, 1947.

No. 113 (Concord) **Military Hospital.**—Captains NFX203620 J. M. C. Bowen, 25th March, 1947, NX203556 B. M. Lipscomb, 26th March, 1947, NX200500 D. H. McGrath, 25th March, 1947, and NX203769 P. Cambourn, 1st April, 1947.

No. 115 (Heidelberg) **Military Hospital.**—Captains VX91447 N. J. Wilkins, 27th February, 1947, VX97981 N. Pinkus and NX207590 J. N. Parker, 26th February, 1947, VX96194 A. L. Bridge, 5th March, 1947, NX208060 E. M. Slattery, 14th March, 1947, NX208042 F. J. Scanlan, 28th March, 1947, NX207263 B. C. Sinclair-Smith, 3rd April, 1947, NX206220 R. G. R. Robinson, 27th March, 1947, VX96618 W. S. Rickards, 20th March, 1947, and VX94083 J. M. Jones, 12th March, 1947.

15th Australian Camp Hospital.—NX204409 Captain B. G. Clarke, 1st April, 1947.

16th Australian Camp Hospital.—NX203550 Captain G. G. Cumming, 8th March, 1947.

20th Australian Camp Hospital.—VX94238 Captain F. P. Callaghan, 6th March, 1947.

34th Australian Camp Hospital.—SX33400 Captain D. F. Hannon, 22nd March, 1947.

50th Australian Camp Hospital.—Captains VX95022 E. Perlman, 27th March, 1947, and VX96337 Q. J. N. Whitehead, 5th March, 1947.

2nd Australian Field Ambulance.—NX191379 Captain A. R. P. Higgin, 28th February, 1947.

Inter-Service Medical Wing Demobilization Centres (Australian Military Forces Component).—Captains QX64245 K. W. Lavers, 7th March, 1947, NX208062 L. F. Bretner, 27th February, 1947, NX207258 E. C. Blomfield, 5th March, 1947, NX207659 J. J. G. McGirr, 6th March, 1947, NX203567 S. J. Wright, 26th February, 1947, NX502740 D. K. Lehmann, 26th March, 1947, and SX33398 D. H. Harris, 19th March, 1947.

Retired List.

The undermentioned officer is placed upon the Retired List on the date indicated with permission to retain his present substantive rank and wear the prescribed uniform:

70th Australian Camp Hospital.—NX204045 Captain V. G. S. Desgrand, 15th March, 1947.

Reserve Citizen Military Forces.

Australian Army Medical Corps.

2nd Military District.—Lieutenant E. M. Shannon (*née* Love) is placed upon the Retired List with permission to retain her rank and wear the prescribed uniform, 3rd April, 1947.

3rd Military District: To be Honorary Captains.—Ian Alexander McDonald, 13th March, 1947, and Harry Greig Cumming, 27th February, 1947.

4th Military District: To be Honorary Captains.—Graham Frank Cheesman and Barton Frederick Venner, 27th February, 1947, and James Arthur Bonnin, William James McCann and Ralph Newton McCann, 24th March, 1947. Captain E. F. Pfaffm is placed upon the Retired List with

permission to retain his rank and wear the prescribed uniform, 1st May, 1947.

5th Military District.—The notification respecting Honorary Captain R. E. Clarke which appeared in Executive Minute No. 257 of 1946, promulgated in *Commonwealth Gazette* No. 5 of 1947, is withdrawn. The notification respecting Captain S. B. Jage which appeared in Executive Minute No. 257 of 1946, promulgated in *Commonwealth Gazette* No. 5 of 1947, is withdrawn. To be Honorary Captain, 24th February, 1947: James Oswald Munro.

6th Military District.—The undermentioned officers are placed upon the Retired List with permission to retain their ranks and wear the prescribed uniform, 13th January, 1947: Colonel H. N. Butler, D.S.O., V.D., Captain N. B. G. Abbott, Honorary Majors E. Brettingham-Moore, and T. C. Butler, Honorary Captain E. A. Elliott, Captains F. A. Ferris and J. A. Geeves, Honorary Captain T. H. Goddard, C.B.E., Captain E. W. Lacy, Honorary Captain L. O. Macnamara, Captains J. Magner, C. C. Marshall and J. McDonald, Honorary Major W. K. McIntyre, Captains G. B. Packham and G. M. Parker, Honorary Major V. R. Ratten, C.B.E., Captain W. Smellie, Major J. Sprent, M.C., Honorary Major H. W. Sweetnam, and Honorary Captains G. J. Walker and K. St. V. Welch. Honorary Captain H. D. Moore is retired, 25th February, 1947. The undermentioned officers are placed upon the Retired List with permission to retain their ranks and wear the prescribed uniform, 4th March, 1947: Honorary Captains H. V. Jackson and R. Y. Mathew, and Captain J. R. Robertson. Lieutenant-Colonel R. M. W. Webster, M.C., E.D., is placed upon the Retired List with the honorary rank of Colonel and with permission to wear the prescribed uniform, 14th March, 1947.

Correspondence.

TREATMENT OF VARICOSE VEINS BY HIGH LIGATION, SECTION AND INJECTION: AN INVESTIGATION.

SIR: The emphasis given by Dr. Moulden to the importance of details in saphenous vein operations in his paper in the issue of August 23, 1947, is most welcome, as there are few operations in which good results are so closely bound to technical considerations, especially his insistence that for good final results we must sclerose the whole saphenous tree to the ankle in one operation by using large doses of a sclerosing agent. Like Dr. Moulden, I, too, have been increasing the amount of "Ethamolin" used over the last few years, and in several cases have given thirty millilitres.

It is difficult, however, to achieve sclerosis of the whole saphenous tree in the one operation by an unvarying technique blindly followed in every case; moreover some of the essential points in technique were perhaps insufficiently emphasized by Dr. Moulden's paper, and there are one or two additional ones which I would like to suggest as being equally necessary.

Firstly, saphenous vein operations should always be performed in a fully equipped theatre with ample assistance. The practice of doing them in an out-patient theatre with inadequate assistance renders good results a matter of luck. Secondly, a dose of sclerosing agent considerably larger than that recommended by Dr. Moulden may be safely used if certain safeguards are attended to. These are:

1. Communicating veins in the thigh, if they are looked for and found to be present, should be divided before a retrograde injection is made. This avoids the chief danger of larger doses—that of forcing the sclerosing agent into the deeper veins and producing femoral thrombosis. If any communicating veins can be located, divided and ligatured, this potential disaster is prevented.

2. Alternatively, when no anastomotic vein can be located, by catheterizing the vein with a ureteric catheter for a distance of nine or twelve inches, the injection of the sclerosing agent is made below the usual level of the anastomotic veins, and it will thus travel more readily to the veins of the calf than to the deep veins of the thigh. Should there be a valve in the thigh (which would produce a "failed injection") the catheter can generally be insinuated past it.

3. As the injection is being made, a nurse (trained for the purpose) massages the vein downwards as far as the ankle, forwards over the shin and back over the calf muscles, thus distributing the sclerosing agent over the whole saphenous tree.

4. The patient at the conclusion of the operation walks back from the theatre to bed, thus increasing the flow of blood through the deep veins at the earliest possible moment.

5. A minor point is the enclosure of the leg to the mid-thigh in "Elastoplast" or Unna's paste. This causes obliteration of the sclerosed veins with the smallest amount of intravascular clot, thus considerably minimizing post-operative pain, reducing the time required for absorption of the thrombus, and minimizing the risk of recanalization.

If the above safeguards are observed, the dose of "Ethamolin" may be safely increased up to 30 millilitres. In a personal series of 121 operations on 80 patients performed in the last four years, the average dose (including three "failed injections") was 15 millilitres. The average dose in the last 50 cases was 20 millilitres.

It has always seemed curious that it should be recommended that one should wait for recurrence before ligating communicating veins. Surely it is better practice to prevent recurrence by locating these communicating veins and tying them in one operation. I find that I am now doing so in one of every three or four cases. Incidentally it is easier to locate them by abandoning ligatures in performing the Trendelenburg and similar tests and substituting pressure by the open hand and the fingers. The finger tip is placed over the suspected point of emergence of the communicating vein, and by this means the site of its emergence can be located with exactness and marked on the skin, preferably the day before operating. I prefer to make a scratch with a needle rather than rely on using paints which may be removed during the preparation of the skin. If the vein is outlined and the site of suitable skin incisions made on them before the operation, the communicating veins can be identified without difficulty, divided, and the injection made into the distal portion as well as into the upper end of the saphenous vein.

In the above series of 121 operations, in 22 cases communicating veins were divided at the same sitting as the high saphenous ligation in the following situations: above the malleolus, 2; below the knee, 4; small saphenous vein behind the knee, 6; above the knee, 8; at the vulva, 2.

Eighteen recurrences are known (mostly in early cases), fourteen of them being caused by communicating veins located as follows: above the malleolus, 1; below the knee, 4; small saphenous vein behind the knee, 6; above the knee, 2; at the vulva, 1.

Had more careful examination been made before the operation, these recurrences would not have occurred. I feel that insufficient attention is paid to the small saphenous vein. I am convinced that within a few years it will become the practice in one out of every three cases to ligature and inject the small saphenous vein.

Two of the remaining four recurrences were cases which in the light of present experience would not have been operated on. They were varicosities resulting from old thrombosis of the deep veins.

Yours, etc.,

421, Ruthven Street,
Toowoomba,
Queensland.
September 5, 1947.

MERVYN HALL.

THE FUTURE OF MEDICAL PRACTICE.

SIR: A report of an address on "The Future of Medical Practice" which appeared in *THE MEDICAL JOURNAL OF AUSTRALIA*, July 19, 1947, has been read here with interest, but not without adverse comment.

It may serve to place Dr. Robb's remarks in a more accurate perspective if it is known that he does not hold office in the New Zealand Branch of the British Medical Association and that his views, particularly those relating to salaried systems and health centres, are opposed strongly by a decisive majority of the profession in New Zealand. The address was not submitted to this Branch and authority was not sought to speak on behalf of the medical profession in New Zealand.

The principle of private practice, the right of the patient to choose and change his medical adviser, the necessity that the patient make some direct contribution and a system of remuneration which tends to maintain, rather than reduce, clinical standards, are cardinal points of our policy. They are based on such sound arguments as have enabled this Branch to resist further experiments which might best be described in Dr. Robb's own words as "political in conception and ignoring technical and professional considerations". Few will be found among the medical profession in New Zealand to support the contention that private practice has failed, particularly where the patient finds some proportion of the cost directly, and there is ample evidence to prove that none would be found to support Dr. Robb's

advocacy of a capitation system, either partial or complete. The criticism which was made under these headings and under that of remuneration and conduct generally is political rather than medical.

The New Zealand Branch is concerned that incomplete and inaccurate views with a highly political bias should gain widespread publicity through the medium of a journal of the British Medical Association without there being any corresponding exposition of the official and more widely approved policy of the New Zealand Branch. The main purpose of this letter is, therefore, to suggest that, should any Branch of the British Medical Association in Australia desire information regarding the system in New Zealand, or assistance in forming its policy towards similar trends, the New Zealand Branch will be happy to recommend speakers whose views will have the advantage of coinciding with those of a substantial majority of the profession here and which will be on a factual rather than a political basis.

It is felt that the Branch's official viewpoint which has been established after much study and which is by no means unprogressive, would be of value as a corrective to that which has already been heard.

Yours, etc.,

ALAN PARK,
Honorary General Secretary, New
Zealand Branch, British Medical
Association.

Wellington,
New Zealand,
September 12, 1947.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Seminar in Medical Statistics.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that Dr. H. O. Lancaster will hold a seminar in medical statistics on Wednesday, October 8, 1947, at 5.45 o'clock p.m., at the School of Public Health and Tropical Medicine, University of Sydney. The subject of the seminar will be "The Accuracy of Certain Routine Haematological and Biochemical Tests", and Miss Helen Newton Turner and Dr. David Duncan will take part in the discussions. If possible, data collected by members of the group will be discussed and any workers in medicine or related sciences are welcome to attend.

Week-End Course at Parramatta.

The Post-Graduate Committee, in conjunction with the Central Western Medical Association, will hold a week-end course at the Parramatta District Hospital, Parramatta, on Saturday, October 18, and Sunday, October 19, 1947. The programme is as follows.

Saturday, October 18, 1947.—2 p.m.: Registration. 2.30 p.m.: "X-Ray Diagnosis in Obstetrics", Dr. D. G. Maitland. 4 p.m.: "Recent Advances in Urology", Dr. Harold Cummine.

Sunday, October 19, 1947.—10 a.m.: "Fractures", I, Dr. McClements Callow. 11.30 a.m.: "Common Skin Diseases", Dr. R. B. Perkins. 2 p.m.: "Fractures", II, Dr. McClements Callow. 3 p.m.: "Industrial Dermatology", Dr. R. B. Perkins.

The fee for the course will be £1 1s. There will be no charge for members of the defence forces. Those wishing to attend are requested to notify Dr. K. S. Macarthur Brown, Honorary Secretary of the Central Western Medical Association, 12, George Street, Parramatta, as soon as possible.

University Intelligence.

UNIVERSITY OF MELBOURNE.

THE following information has been taken from the *University Gazette* of the University of Melbourne for August 18, 1947.

Professor Martin, Professor Hartung and Professor Burnet have been appointed to the Defence Scientific Advisory Committee, which has been set up to advise the Commonwealth Government on scientific developments in relation to defence.

Professor MacCallum and Dr. T. E. Lowe have been renominated as representatives of the Faculty of Medicine to the Anti-Cancer Council of Victoria.

Sir Alan Newton, Stewart Lecturer in Surgery, has been appointed to the Advisory Board of the Women's Hospital.

Professor Sunderland has resumed duties as Professor of Anatomy after an absence of three months on sick leave.

Mr. A. T. Austin, University Travelling Scholar, represented the University at the Eleventh International Congress of Pure and Applied Chemistry in London.

Notice has been received from the Commissioners for the Exhibition of 1951 that Mr. L. Riddiford, M.Sc., a University Travelling Scholar, has been awarded a science research scholarship. He will study experimental nuclear physics at Birmingham or Manchester.

Mr. P. G. Law, Lecturer in Physics, has been appointed senior scientific officer to the Australian Antarctic Expedition. He expects to leave with the expedition in December next and to be absent for about four months.

Mr. Victor Hurley, sometime Stewart Lecturer in Surgery, has been appointed honorary consulting surgeon to the Royal Melbourne Hospital.

A German specialist in microchemistry, Dr. K. F. Tettweiler, is expected to arrive in Melbourne by air on August 18. He comes to this country under the sponsorship of the Commonwealth Government, initially for a period of nine months, to organize microchemical analysis, an indispensable service for modern organic and biochemical research. He will be attached to the Biochemistry Department of the university.

Miss M. McQuillan, research worker in biochemistry, has been awarded a grant by the Australian National Health and Medical Research Council to visit America for inquiries into developments in thyroid research. She proposes to leave at the end of 1947 and will be absent for about six months.

Study in British Occupied Germany.

A letter has been received by Dr. R. H. Samuel from the German Educational Branch of the British Foreign Office, setting out the conditions under which British students (including Australian graduates proceeding abroad) may study at German universities in the occupied zone which are willing to accept them.

Because of the economic conditions there, students are billeted with the family of a member of the Occupation Force, civil or military. The cost of travelling from England is roughly £10, and fees per term are in the vicinity of £20, payable direct to the Foreign Office. Board and lodging would amount to an additional £9 per month, payable to the British family concerned. Total cost per term would therefore be about £80 sterling.

The scheme is being conducted in conjunction with the International Student Service (World Student Relief), and inquiries as to selection and administrative details should be addressed to Miss Margaret Holmes, Australian Student Christian Movement, 182, Collins Street, Melbourne, C.I.

Public Health.

STREPTOMYCIN IN PULMONARY TUBERCULOSIS.

THE following statement on the use of streptomycin in tuberculosis is published at the request of the Acting Director-General of Health, Commonwealth Department of Health.

Streptomycin inhibits the growth of *Mycobacterium tuberculosis* *in vivo* clinically and experimentally. From clinical observations it appears that its action is bacteriostatic rather than bactericidal, and it may be accepted that it exerts a suppressive action upon the course of most forms of tuberculosis in human beings.

The development of bacterial resistance to this antibiotic is a very frequent occurrence, manifesting itself usually between the twenty-eighth and fifty-sixth day of treatment. Thus the greatest field of usefulness of streptomycin should be found in those forms of the disease which might be permanently benefited by therapy of one or two months' duration. It is equally apparent that the course of chronic fibrotic forms of the disease is unlikely to be affected in any permanent manner within this period of time, although temporary regression may occur.

At present it is considered that streptomycin is of value in the treatment of the following forms of tuberculosis:

1. Generalized haematogenous tuberculosis and tuberculous meningitis. These are acute manifestations of the disease

and the immediate effect of treatment is often dramatic. The final results of therapy are far from satisfactory.

2. Non-surgical pulmonary tuberculosis. The caseo-pneumonic and the predominantly exudative forms respond favourably. A rapidly progressive lesion may become sufficiently controlled to permit of other measures such as collapse therapy being undertaken. It is of particular value in controlling an acute spreading lesion following hæmoptyses.

3. Ulcerative lesions of the larynx, trachea and bronchus. Considerable improvement may occur, and if the parenchymal lesion can be controlled recurrence is unusual.

4. Surgical pulmonary tuberculosis. The use of streptomycin pre-operatively and post-operatively is believed to lessen the risks of post-operative tuberculous complications and to hasten the recovery of patients. It is well to remember that the longer the pre-operative period of administration is continued, the less time is available post-operatively before bacterial resistance is likely to occur.

5. Tuberculosis of the genito-urinary tract. In renal tuberculosis amelioration of symptoms may occur, but streptomycin is not curative. Cystitis is improved considerably, and in early cases cure may be effected. Fistulae associated with tuberculous epididymitis have been reported as cured.

6. Tuberculosis of bone and joints. Alleviation of symptoms and temporary regression of the lesion may be expected.

Methods of Administration and Dosage.

The dosage is from one to three grammes within twenty-four hours, given in divided doses intramuscularly every four hours. In the majority of patients two grammes will be found adequate, and on this dosage it is thought that toxic manifestations are less frequent.

Solutions containing 25 to 100 milligrammes per millilitre may be used for topical application, intrabronchially or in aerosol sprays. In ulcerative lesions of the respiratory tract topical application or aerosol spray should be used in addition to parenteral administration. It is recommended that two millilitres be used every hour for eight to ten hours daily if possible.

In tuberculous meningitis 100 to 200 milligrammes in two to five millilitres of isotonic saline solution should be given every twenty-four to forty-eight hours for two to six weeks in addition to parenteral administration.

Limitations and Dangers of Streptomycin in Tuberculosis.

Usually tuberculosis produces destructive lesions within the organs it attacks. Healing is accompanied by much fibrosis. Streptomycin cannot restore tissue already destroyed.

In the majority of cases therapeutic activity ceases within two months due to bacterial resistance, and therefore other methods of treatment must not be neglected. In almost every patient in whom it is given for a period of more than three weeks some toxic manifestations are certain to occur. Therefore this antibiotic should be withheld from those patients who are making satisfactory progress under conventional therapy. It should not be regarded as a substitute for other accepted forms of treatment.

Obituary.

JOSEPH PETER KELLY.

We are indebted to Dr. A. E. Rowden White for the following appreciation of the late Dr. Joseph Peter Kelly.

The death of Dr. Joseph Peter Kelly on July 29, 1947, at a hospital in Cheltenham, Victoria, removes a country practitioner of the old school. He was aged eighty-seven years, and his life had been varied and of an adventurous nature. His patriotic spirit and love for the Empire were well emphasized by his great desire to support the Mother Country in some of her trials. Not long after he came to Australia he enlisted with the Bushmen's Contingent, and served as a trooper in the Boer War, and like a great many other people of his ilk, he thoroughly enjoyed the roving and adventurous life during that campaign. On his return he was in practice at Dookie, and when Great Britain declared war against Germany on August 4, 1914, he immediately walked out of his practice and joined up—he would not even wait for his *locum tenens* to arrive, he felt this urge to enlist was so great. He served in Gallipoli as an

"Anzac", and after returning to Egypt, was sent to the front line as a medical officer in France, and remained on duty for a very lengthy period, until he was discovered by the Director-General of Medical Services to be very much over age for front-line service, and was returned to a base hospital, namely Number 2 Australian General Hospital at Wimeureux, near Boulogne. He proved to be a very good reliable medical officer and received his majority for service and conscientious work. He was well known in France to his fellow officers for his agreeable and friendly actions, and he made an excellent companion in sports and long walks in that interesting and historic part of France. Sometime after the Armistice when Number 2 Australian General Hospital was closed and dismantled, he was returned to England and later, with another officer, was in charge of Horseferry Road for the final repatriation work. On his return to Australia he spent a considerable time at a repatriation hospital for pulmonary conditions among returning soldiers. After this long and very useful career of duty for repatriation he left the services for a large insurance society, which necessitated his touring the different towns of the eastern States. He finally settled down in one of the suburbs close to Port Phillip Bay to enjoy the leisure of the autumn and winter of his long life.

We wish to extend our sympathy to the sole remaining member of his family, an elderly sister who lives in Ireland.

Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Fink, Siegfried, registered in accordance with the provisions of Section 17 (b) of the *Medical Practitioners Act, 1938-1945*, 115, Macleay Street, Potts Point.

THE undermentioned have been elected as members of the New South Wales Branch of the British Medical Association:

Angel, Gertrude, provisional registration, 1947 (Univ. Sydney), 31, Muston Street, Mosman.

Brown, Thomas Frederick, M.R.C.S., 1909 (England), L.R.C.P., 1909 (London), D.P.H., 1918 (London), 10, Church Street, Randwick.

Chapman, Patricia Joan, provisional registration, 1947 (Univ. Sydney), Balmain and District Hospital, Balmain.

Coombes, Rollin Vernon, provisional registration, 1947 (Univ. Sydney), Sydney Hospital, Sydney.

De Monchaux, Robert Joseph, M.B., B.S., 1946 (Univ. Sydney), 7, Almora Street, Mosman.

Engel, Charles, registered in accordance with the provisions of Section 17 (b) of the *Medical Practitioners Act, 1938-1945*, 22, Ocean Street, Edgecliff.

Frank, Alexander, registered in accordance with the provisions of Section 17 (b) of the *Medical Practitioners Act, 1938-1945*, 235, Macquarie Street, Sydney.

Hayvatt, Miles Tom, M.B., B.S., 1946 (Univ. Sydney), 3, Bellevue Park Road, Bellevue Hill.

Henniker, Reginald Noel, M.B., B.S., 1943 (Univ. Sydney), 4, Jamieson Parade, Collaroy.

Lewis, Montague Bernard, provisional registration, 1947 (Univ. Sydney), St. George Hospital, Kogarah.

McDonnell, Lawrence Edward, M.B., B.S., 1944 (Univ. Sydney), 13, Gilbert Park, Manly.

McDowell, Moira Agnes, M.B., 1945 (Univ. Sydney), Lucky Corner, Coonamble.

Newton, John Hilton, M.B., 1941 (Univ. Sydney), 125, Great North Road, Five Dock.

Pettinger, Douglas Firth, provisional registration, 1947 (Univ. Sydney), 57, Kimberley Avenue, Lane Cove.

Roarty, John Stanislaus, M.B., B.S., 1947 (Univ. Sydney), Lewisham Hospital, Lewisham.

Van Dugteren, Noel Rothero, provisional registration, 1947 (Univ. Sydney), Manly District Hospital, Manly.

Sabel, Verleen Mary, provisional registration, 1947 (Univ. Sydney), District Hospital, Goulburn.

Smith, Alexander Hylton, provisional registration, 1947 (Univ. Sydney), Maitland Hospital, West Maitland.

Walker, John Noel, M.B., B.S., 1943 (Univ. Sydney), 129, Mitchell Street, Stockton.

Wiles, Helen Booth, M.B., B.S., 1946 (Univ. Sydney), 15, Wharf Road, Gladsville.

Wyse, Sydney James, M.B., B.S., 1946 (Univ. Sydney), Cessnock District Hospital, Cessnock.

The undermentioned have applied for election as members of the South Australian Branch of the British Medical Association:

Russell, Ronald Edyvane, M.B., B.S., 1946 (Univ. Adelaide), 19, Parker Street, Mile End.
 Fox, Robert Owen, M.B., B.S., 1925 (Univ. Adelaide), Pt. Noarlunga.
 Bennett, Donald Collier, M.B., B.S., 1946 (Univ. Adelaide), 28, Wood Street, Whyalla.
 Nicholls, Jack Montague, M.B., B.S., 1946 (Univ. Adelaide), 85, Flindon Road, Woodville.
 Wilson, Charles Graham, M.B., B.S., 1947 (Univ. Adelaide), Royal Adelaide Hospital, Adelaide.
 Hecker, Robert, M.B., B.S., 1947 (Univ. Adelaide), Royal Adelaide Hospital, Adelaide.

The undermentioned have been elected as members of the South Australian Branch of the British Medical Association:
 Chard, June Myra, M.B., B.S., 1947 (Univ. Adelaide), 30, Bollingbroke Street, Toorak Gardens.
 McCann, Ralph Newton, M.B., B.S., 1946 (Univ. Adelaide), 52, Tusmore Avenue, Tusmore.

THE FEDERAL MEDICAL WAR RELIEF FUND.

The following contributions to the Federal Medical War Relief Fund have been received:

New South Wales.

R. W. Croft, £25.
 C. R. M. Laverty, £10 10s.
 R. C. Geeves, £5 5s.
 Total: £40 15s.
 Grand total: £19,611 6s. 6d.

Notice.

THE AUSTRALIAN NATIONAL ANTARCTIC RESEARCH EXPEDITION, 1947.

THE Australian Government is towards the end of this year sending to Antarctica a National Research Expedition. The expedition will be composed of three groups of personnel—a party on the ship *Wyatt Earp* and two island parties which will remain on Macquarie and Heard Islands respectively for a period of approximately fifteen months. A medical officer is required for each of the island parties. Medical practitioners who are interested are invited to communicate with the Antarctic Planning Committee, Room 51, "S" Block, Victoria Barracks, St. Kilda Road, Melbourne.

Corrigendum.

AN error has been discovered in this week's leading article as the last pages of the issue go to press. The statement towards the end of the last paragraph but one that the National Corporation for the Care of Old People begins its work with a grant of £500,000 from the Lord Mayor of London's Fund is incorrect. The grant comes from the Nuffield Foundation. The Lord Mayor's Air Raid Distress Fund has set aside a sum on which the Corporation can draw for the relief of old persons who have suffered distress from air raids.

Books Received.

"Surgical Pathology", by William Boyd, M.D., Dip. Psychiat., M.R.C.P. (Edinburgh), F.R.C.P. (London), LL.D. (Sask.), M.D. (Oslo), F.R.S.C.; Sixth Edition; 1947. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 9½" x 6¼", pp. 868, with many illustrations, some of them coloured. Price: 70s.

"Diseases of Metabolism, Detailed Methods of Diagnosis and Treatment: A Text for the Practitioner", edited by Garfield G. Duncan, M.D., with contributions by various authors; Second Edition; 1947. Philadelphia and London: W. B. Saunders

Company, Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 9½" x 6¼", pp. 1064, with many illustrations, some of them coloured. Price: 84s.

"Advances in Pediatrics", by various authors; Volume II: 1947. New York: Interscience Publishers, Incorporated, London: Interscience Publishers, Limited. 9" x 6", pp. 420, with many illustrations. Price: \$6.75.

Diary for the Month.

SEPT. 23.—New South Wales Branch, B.M.A.: Ethics Committee.
 SEPT. 24.—Victorian Branch, B.M.A.: Council Meeting.
 SEPT. 25.—New South Wales Branch, B.M.A.: Branch Meeting.
 SEPT. 26.—Queensland Branch, B.M.A.: Council Meeting.
 OCT. 1.—Western Australian Branch, B.M.A.: Council Meeting.
 OCT. 1.—Victorian Branch, B.M.A.: Branch Meeting.
 OCT. 2.—South Australian Branch, B.M.A.: Council Meeting.
 OCT. 3.—Queensland Branch, B.M.A.: Branch Meeting.
 OCT. 3.—New South Wales Branch, B.M.A.: Annual Meeting of Delegates.
 OCT. 7.—New South Wales Branch, B.M.A.: Council Quarterly.
 OCT. 10.—Queensland Branch, B.M.A.: Council Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmalm United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute; Brisbane City Council (Medical Officer of Health). Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognise any claim arising out of non-receipt of journals unless such notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad per annum payable in advance.